

Atlas of Stroke Mortality

CDC

Heart Disease
and Stroke



**Racial, Ethnic, and Geographic
Disparities in the United States**

2003



DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention

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To view interactive maps of stroke mortality or download sections of this atlas, visit www.cdc.gov/cvh/maps.

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Atlas of Stroke Mortality

Racial, Ethnic, and Geographic Disparities in the United States

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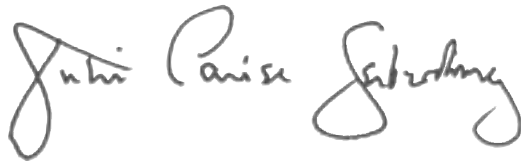
National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention, Department of Health and Human Services

As the nation's prevention agency, the Centers for Disease Control and Prevention (CDC) is committed to reducing the burden of stroke—the third leading cause of death and a leading cause of serious, long-term disability in the United States. Deaths from stroke are largely preventable, and with targeted public health efforts, we can alleviate much of the heavy burden of this disease. To meet this challenge, CDC monitors the geographic and temporal trends in stroke rates among racial and ethnic groups, strengthens the delivery of primary and secondary prevention health services to all such groups, and develops policy recommendations that support stroke-free environments for all residents of the United States.

The *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States* provides health professionals and concerned citizens at local, state, and national levels with information essential to identifying populations at greatest risk for stroke and in greatest need of prevention efforts. This publication provides, for the first time, county-level maps of stroke for the five largest racial and ethnic groups in the United States—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. These maps provide crucial information for tailoring prevention efforts to communities most in need.

This publication is the third in a series of CDC atlases related to cardiovascular disease that have been published through a collaboration between CDC and West Virginia University. The first was *Women and Heart Disease: An Atlas of Racial and Ethnic Disparities in Mortality*, and the second was *Men and Heart Disease: An Atlas of Racial and Ethnic Disparities in Mortality*. Together, these publications have informed policy makers and researchers about the serious disparities in heart disease mortality.

Now, I am pleased to share with you the *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States*. I encourage you to use these data to improve the delivery of preventive health services and to create stroke-free environments for all people.

A handwritten signature in black ink, reading "Julie Louise Gerberding". The signature is fluid and cursive, with the first name "Julie" being the most prominent.

Julie Louise Gerberding, MD, MPH
Director, Centers for Disease Control and Prevention

Awareness of the health needs of minority populations in the United States is growing, as governmental and nongovernmental health agencies continue to identify the gaps in health care and health outcomes among racial and ethnic groups and work to develop strategies to reduce these gaps. Since its inception in 1998, the CDC's Office of the Associate Director for Minority Health has been committed to improving the health status of racial and ethnic minority populations throughout the United States.

A central focus of our activities is implementing the Department of Health and Human Services (HHS) Initiative to Eliminate Racial and Ethnic Disparities in Health. Through this initiative, HHS seeks to eliminate health disparities among minority populations by 2010 in six priority health status areas—one of which is cardiovascular disease (i.e., heart disease and stroke). The cornerstone of CDC's efforts to support this initiative is the Racial and Ethnic Approaches to Community Health (REACH) 2010 program. This two-phase, 5-year demonstration project supports community coalitions in designing, implementing, and evaluating community-driven strategies to eliminate health disparities.

We recognize that achieving HHS's goal depends on a major national commitment to identify and address the underlying causes of racial and ethnic disparities. New insights are needed to understand the determinants of these disparities among stroke rates and to apply our knowledge toward eliminating them. In this regard, the *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States* is a timely publication that provides a new perspective on the racial and ethnic patterns of stroke at the community level.

The maps in this publication will enable health researchers to develop new hypotheses regarding the determinants of the geographic patterns of stroke for each racial and ethnic group. These maps will also allow health professionals in local, state, and national health agencies to design new programs and policies tailored to the needs of communities with the highest rates of stroke mortality.

As we continue to identify the health needs of racial and ethnic minority populations, additional opportunities will arise to expand and modify our public health and medical care strategies for preventing and treating stroke among all people.



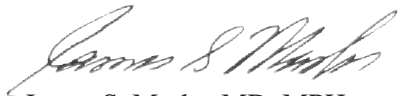
Walter W. Williams, MD, MPH
Associate Director for Minority Health, Office of the Director
Centers for Disease Control and Prevention

A Message from the Director of CDC's National Center for Chronic Disease Prevention and Health Promotion

The National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) is committed to continuing the strong tradition of using state-of-the-art mapping technologies to highlight geographic, racial, and ethnic disparities in chronic diseases. I am excited about the *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States*, which uses Geographic Information Systems (GIS) to highlight the existing disparities in stroke mortality—the third leading cause of death and a leading cause of serious, long-term disability in the United States.

With public health professionals working in an environment that is increasingly information-intensive, GIS can play a critical role in determining where prevention activities are most needed. This information can lead to action to improve the quality of primary and secondary health care and the accessibility of needed services. This report highlights the large geographic disparities in stroke deaths, as well as the differences reported by race and gender. We know a great deal about how to prevent stroke and how to effectively treat it when the signs and symptoms are recognized early. Disparities as large as those reported here tell us that what is known to science is not being applied to people at risk. Although the maps in this publication might look attractive, they paint a picture of where our nation stands in terms of disparities in stroke mortality, and the picture is not pretty.

My hope is that the availability of stroke mortality data at the local level, presented in the *Atlas of Stroke Mortality*, will galvanize the formation of new partnerships and enhance existing ones among state and local health agencies and community organizations working together to create stroke-free working and living environments.



James S. Marks, MD, MPH
Director, National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention

I am pleased to present the *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States*. Each year in the United States, an estimated 600,000 people suffer a stroke, and more than 150,000 people die of a stroke. Approximately 4.5 million stroke survivors are believed to be alive today. In addition to this heavy burden of death and disability, there are marked racial and ethnic disparities related to stroke. Although much is known about the excess burden of stroke mortality among African Americans, relatively less has been published about the burden among other racial and ethnic minorities. This atlas identifies the disparities among other racial and ethnic groups and places special emphasis on the geographic disparities in stroke mortality that exist for all groups. An important finding is the substantial differences in the patterns of geographic disparity by racial and ethnic group. These differences underscore the need for stroke prevention programs and policies to be tailored to the needs of specific communities in specific locales.

This landmark document supports elimination of health disparities, one of the two overarching goals of *Healthy People 2010*, and addresses the important need to reduce the risk for stroke among all racial and ethnic groups. The maps in this *Atlas of Stroke Mortality* present county-by-county stroke mortality rates for the entire United States and identify the places where members of each of the five largest racial and ethnic groups experience the highest rates. With this information, public health professionals at local, state, and national levels will be able to tailor prevention resources to the populations in greatest need of additional services.

Although stroke mortality has been declining for several decades, the rate of decline has varied by racial and ethnic group, and recent data indicate that this decline is leveling off. This alarming trend underscores the importance of enhancing our efforts to support innovative, community-based strategies for reducing the risk for stroke. For all racial and ethnic groups, we can expect to achieve the greatest cardiovascular health benefits through prevention. The *Atlas of Stroke Mortality* indicates where prevention programs and policies are most needed and can have the greatest benefit.

This publication is an extremely valuable resource in our endeavors to further prevent stroke across the nation. We hope that you will also find it a useful tool as you design programs and policies to prevent stroke among people in your communities.

A handwritten signature in black ink, appearing to read 'G. Mensah', with a stylized, flowing script.

George A. Mensah, MD, FACP, FACC, FESC
Branch Chief, National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention

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A Georgetown University medical school student
celebrates his graduation with his parents.



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Introduction

In 1999, stroke was the third leading cause of death in the United States and a leading cause of serious, long-term disability, placing an enormous burden on the public's health. Approximately 600,000 U.S. residents suffer a new or recurrent stroke each year, and roughly 167,000 die of a stroke each year.¹ In 1999, a total of 1.1 million U.S. adults reported functional limitations and difficulty with activities of daily living resulting from a stroke.¹ Substantial disparities in the health and economic burden of stroke among racial and ethnic populations have been documented, with African Americans far more likely to die of stroke than members of other racial and ethnic groups in the United States.²

In addition, an alarming trend has been observed in stroke mortality rates during the past decade. Although stroke mortality declined substantially for many racial and ethnic groups during the 1970s and early 1980s, little improvement was made during the 1990s.³ Equally as disturbing, stroke hospitalizations actually increased 18.6% from 1988 through 1997.⁴ These observations have raised awareness within the public health and medical professions that new and innovative efforts are needed to more effectively prevent stroke. In addition, there is increased appreciation of the need for public health agencies and other institutions to act locally to provide more targeted and culturally appropriate stroke prevention programs and policies.

To achieve these goals, the *Atlas of Stroke Mortality: Racial, Ethnic, and Geographic Disparities in the United States* presents county, state, and national data for 1991–1998. Data are presented for both women and men and for the five largest racial and ethnic groups in the United States—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and

whites. The national maps allow comparison of rates across all U.S. counties, whereas state maps allow comparison across counties within each state. This complementary information is useful for targeting resources to communities at high risk.

Substantial geographic disparities in stroke mortality have been observed in the United States for decades.^{5–12} Early on, the term “stroke belt” was coined to describe the concentration of high stroke mortality rates in the southeastern United States. The first study that examined the geographic pattern of stroke mortality used the state as the unit of analysis.⁵ Later studies have reported more detailed patterns in the geographic disparities in stroke mortality by using smaller units of analysis (i.e., health service areas, state economic areas, and counties).^{6–8, 10–12}

Missing from the literature, however, are the patterns of geographic disparities in stroke mortality for racial and ethnic groups other than blacks and whites. In this publication, we present maps and tables that document these disparities among American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites during 1991–1998. The patterns of geographic disparities in stroke mortality vary dramatically among these groups and should be carefully studied when prevention programs and policies are planned or the determinants of these disparities are investigated.

Existing studies of the geographic disparities in stroke mortality have confirmed a concentration of high stroke mortality rates in the Southeast for all persons ages 35 and older, for blacks as well as whites, and for both women and men. Hypotheses regarding the determinants of the loosely defined stroke belt have evolved through the years. Initially, researchers believed the stroke belt was a fixed

geographic entity, prompting geologic hypotheses on the deficiency of trace elements (e.g., selenium) and the hardness of the water.⁶ However, evidence exists that the geographic pattern of the stroke belt has changed substantially in only 25 years.¹⁰

In 1962, a large concentration of counties with high stroke death rates was reported in the coastal states of North Carolina, South Carolina, and Georgia. By 1988, this concentration had diminished, and a new concentration of counties with high rates was observed in the Mississippi Delta. This observation shifted the hypotheses away from properties of the physical environment and focused researchers' attention on the possibility that differential trends in social conditions—including the prevalence of risk factors, the social environment, access to care, and migration patterns—could be contributing to the observed geographic disparities in stroke mortality.^{10,13} Although geographic bias in the accuracy of stroke diagnosis and/or death certificate reporting may also contribute to the observed geographic disparities in stroke mortality, no studies have confirmed this hypothesis to date.^{14–16}

A few studies have examined the associations of geographic disparities in stroke risk factors with geographic disparities in stroke mortality. A 1977 study of blacks and whites in three geographically diverse communities with different rates of stroke mortality (low, medium, and high) reported that only blood glucose levels were correlated with stroke mortality for both blacks and whites. Blood pressure levels correlated only with stroke mortality rates for black women and white men across the three communities, and no consistent patterns were observed for the other risk factors included in the study (i.e., serum cholesterol, weight and height measurements, and cigarette smoking).¹⁷

Similarly, data from the first National Health and Nutrition Examination Survey (NHANES I) Epidemiologic Follow-Up Study indicated that, even after adjusting for the leading stroke risk factors (i.e., age, smoking, diabetes, history of heart disease, education, systolic blood pressure, alcohol use, and physical activity), people living in the Southeast still had the highest risk for stroke.¹⁸ In 1997, the contribution of socioeconomic status (SES) (as measured by education and family income) to the geographic disparities in stroke mortality was evaluated using the National Longitudinal Mortality Study (NLMS).¹⁹ Although individual SES was strongly associated with the risk for stroke, it did not contribute substantially to the geographic patterns of stroke mortality reported in the NLMS.

Two studies have examined the role of characteristics other than stroke risk factors. A study of the effect of interstate migration patterns on geographic disparities in stroke mortality during 1979–1981 reported that stroke mortality rates in several states were strongly influenced by the patterns of people migrating into the states and that these patterns differed for blacks and whites.²⁰ Although the rates for whites in three states (Florida, Arizona, and Colorado) and the District of Columbia were lower because of in-migration, rates for blacks were lower in only one state (Colorado), but were higher in 21 states.

Another study examined the association between occupational structure (a measure of the social and economic resources available to residents of a community) and stroke mortality rates in communities in the South. The results indicated that communities with the lowest levels of occupational structure (e.g., the fewest resources) experienced the highest rates of stroke mortality.²¹

The *Atlas of Stroke Mortality* reflects our conviction that one of the keys to reducing the burden of stroke nationwide is to focus our attention on patterns of stroke mortality in local areas. Why is it critical to understand local geographic disparities in the burden of stroke mortality? We contend that health disparities among places reflect underlying inequalities in local social environments that make some communities more health-promoting than others. The social environment provides the context within which individuals are exposed to structural risk factors (e.g., lack of economic opportunity, poverty, social isolation) that contribute to the adoption of unhealthy behaviors (e.g., cigarette smoking, physical inactivity, poor diet).

Ameliorating the social environment in local communities will require structural and institutional changes, improvements in community social relations, and reductions in inequalities within those communities. Identifying the places that bear the greatest burden of stroke mortality is a necessary first step to targeting appropriate resources to improving the local social environment and health outcomes in those communities.

An important strength of this publication is our examination of geographic disparities in stroke mortality for the five leading racial and ethnic groups in the United States. Previous reports have focused predominantly on blacks and whites. Although data quality limitations exist for groups other than blacks and whites, we hope that presenting these results will highlight the need to improve the quality of death certificate and population data for all racial and ethnic groups and provide useful information to public health agencies and advocacy groups working to improve the health outcomes of diverse populations.

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A swim team works out at a public pool
in the District of Columbia.



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1 Racial and Ethnic Disparities in Stroke

The disparities in stroke death rates between blacks and whites in the United States have been well documented, with blacks consistently having dramatically higher stroke death rates than whites.^{1–4} The national health agenda outlined in *Healthy People 2000* called for a 49% reduction in age-adjusted stroke death rates from 1987 through 2000 for blacks and a 34% reduction for the total population.⁵ Neither of these objectives have been met. During 1990–1998, stroke death rates decreased only 11% for blacks and 9% for the total population.⁶ Although the amount of the reduction was slightly greater for blacks than whites, the substantial gap between age-adjusted stroke death rates (for those ages 35 years and older) for blacks (156/100,000) and whites (113/100,000) still existed in 1998.

Disparities in stroke death rates among other racial and ethnic groups in the United States have not been examined as extensively, but a 2001 study indicated substantial gaps among the largest racial and ethnic groups in the United States.⁷ The largest disparities occurred among adults ages 35–64 years. To address these problems, the Department of Health and Human Services launched the Initiative to Eliminate Racial and Ethnic Disparities in Health in 1998. This initiative seeks to eliminate disparities in six targeted health status areas, including heart disease and stroke. In addition, one of the two overarching goals of the updated *Healthy People 2010* is to “eliminate health disparities among segments of the population including differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation.”⁸

In this section, we provide information regarding racial and ethnic disparities in the distribution of types of stroke (i.e., hemorrhagic and ischemic) and the age distribution

of stroke deaths. We also present frequency distributions of county death rates for the following racial and ethnic groups: American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites (see Appendix B for definitions of these groups). We use the terms “black” and “African American,” as well as the terms “Latina/Latino” and “Hispanic,” interchangeably throughout this publication.

The Social Construction of Race

Like several experts in human evolution, we recognize race and ethnicity as valid scientific categories, but not as valid biological or genetic categories.^{9–10} The health sciences include both biological and social sciences, and from a social science perspective, racial and ethnic categories reflect the reality of socially distinct groups in the United States. Ethnic groups typically share certain characteristics, such as culture and language, and they are often multiracial. Contemporary race divisions are the result of historical events—in particular, the often hostile encounters (e.g., wars, colonizations) between population groups that were formerly isolated geographically.

Differences in physical appearance between population groups engaged in political conflict have often acquired inflated social significance compared with differences in physical appearance among individuals of the same group. The idea that geographically defined human social groups, such as “Africans” or “Japanese,” were actually biologically and genetically distinct human “races” or “subspecies” gained popular credence in the nineteenth and early twentieth centuries.¹¹ Most of the scientific evidence generated during those times to support theories of biologically distinct human races has since been discredited and disavowed by many scientists.^{11–13} These

scientists have demonstrated that the significance attributed to these physical characteristics is wholly social and historical in origin and does not reflect biologically or genetically important differences among people.²

Empirical evidence from population biology demonstrates why the theory of genetically distinct races is incorrect. First, all human beings share the same genes. This is what defines us as a species. We all have two copies of essentially all genes because our chromosomes come in pairs—one inherited from our mother, the other inherited from our father. Slight variations in the form, and sometimes the function, of individual genes do exist in human populations. These gene variations are called alleles. However, 75% of all human genes are monomorphic, meaning that only one allele exists in all people.⁹ Only a tiny fraction of all human alleles affect gene function in a way that leads to disease. Most importantly, no specific alleles (whether detrimental, beneficial, or neutral) have been proven to exist only in one racial or ethnic population and not in others. For example, the allele of the hemoglobin gene that leads to sickle cell disease, typically thought to be solely found in Africans, is also found in some Asian populations. It is also important to note that the genetic variation within each racial group is larger than the variation between racial groups.¹³

In summary, the five racial and ethnic groups described in this *Atlas of Stroke Mortality* are socially, but not biologically, distinct groups. Moreover, we recognize that each of these broad racial and ethnic groups includes people of tremendous diversity with regard to culture, socioeconomic status, heritage, and area of residence. If we accept the idea that different racial and ethnic groups do not vary systematically in their inherent genetic suscepti-

bility to disease, then to what can we attribute racial and ethnic disparities in stroke death rates? Current research suggests a number of possibilities, including differences in social class, culture, behavioral risk factors, psychosocial risk factors, and the direct effects of racism, segregation, and discrimination.¹⁴

Misreporting of Race and Ethnicity on Death Certificates

An important concern when examining racial and ethnic disparities in stroke death rates is the accuracy of race and ethnicity information reported on death certificates. If a close family member is not available to report the race and ethnicity of the decedent, then the person filling out the death certificate (e.g., medical examiner, funeral director) must rely on factors such as physical appearance and surname to determine race and ethnicity. Separate entries are available for race (American Indian or Alaska Native, Asian or Pacific Islander, black, and white) and Hispanic origin (yes or no).

Unfortunately, evidence from several studies indicates that race and ethnicity are not always reported accurately on death certificates.^{15–19} In some instances, American Indians and Alaska Natives, as well as Asians and Pacific Islanders, are mistakenly identified as white, and Hispanics are mistakenly reported as non-Hispanics. This misreporting results in artificially low death rates for those minority groups. Race is rarely misreported for blacks. Misreporting of race and ethnicity on death certificates does not significantly increase death rates for whites given the small number of decedents who are misidentified as white on their death certificates relative to the large white population.

One study compared racial and ethnic information from the Current Population Survey (a monthly survey conducted by the Bureau of the Census) with similar data on death certificates for 43,000 people who died during 1979–1985.¹⁵ The study reported that race was coded incorrectly on death certificates for 0.8% of whites, 1.8% of blacks, 17.6% of Asians and Pacific Islanders, and 26.6% of American Indians and Alaska Natives. Hispanic ethnicity was miscoded for 10.3% of persons who self-identified as Hispanic on the survey, with the greatest errors reported among those who identified themselves as Cuban or “other Hispanic.”

Figure 1.1
Categories of Stroke Deaths
Among People Ages ≥35 Years,
by Racial and Ethnic Group,
1991–1998



A similar study reported high rates of disagreement between case reports for people who died of acquired immunodeficiency syndrome (AIDS) and death certificates for American Indians and Alaska Natives (46%), Asians and Pacific Islanders (12%), and Hispanics (14%).¹⁶ A study of infant mortality in California reported substantial underestimation of rates for American Indians and Asians.¹⁷ Correct reporting of American Indian origin on death certificates was found to be associated with tribal affiliation and percentage of American Indian ancestry in a study that linked Indian Health Service records and death certificates in Washington State.¹⁸

A recent report from CDC’s National Center for Health Statistics estimates that if misreporting of race and ethnicity on death certificates and population undercounts in census files were corrected, national death rates (for all causes of death combined) would be 21% higher than currently reported for American Indians and Alaska Natives, 11% higher for Asians and Pacific Islanders, and 2% higher for Hispanics.¹⁹ No studies to date have evaluated the extent of geographic variation in the accuracy of reporting race and ethnicity on death certificates or in the degree of population undercounts.

Specific Categories of Stroke Deaths

There are two main types of stroke: ischemic and hemorrhagic. Ischemic strokes are caused by a blockage of the arterial blood supply to the brain. According to research

studies in which detailed tests were performed to determine the type of stroke, 70%–80% of all stroke deaths are ischemic.²⁰ Hemorrhagic strokes are less prevalent but more lethal. Hemorrhagic strokes occur when blood vessels rupture and cause bleeding either in the brain or the space between the brain and the skull.

The percentage of definite hemorrhagic strokes varied substantially among racial and ethnic groups (Figure 1.1). Asians and Pacific Islanders had the largest percentage (38%), followed by Hispanics (32%), American Indians and Alaska Natives (26%), blacks (24%), and whites (18%). The range of percentages for definite ischemic stroke was much narrower—from 8% for American Indians and Alaska Natives and Asians and Pacific Islanders to 11% for whites. Unspecified and ill-defined stroke deaths accounted for a large percentage of stroke deaths among all racial and ethnic groups. This was due in part to the low rate of CT scans performed on people who died of a stroke and the difficulty in accurately diagnosing the exact type of stroke in the absence of a CT scan.

Age Distribution of Stroke Deaths

Stroke death rates increase dramatically with age, but there are substantial racial and ethnic disparities in the age distribution of stroke deaths (Figure 1.2). Among whites, only 25% of stroke deaths occurred before age 75; among the other racial and ethnic groups, the percentage of deaths before age 75 ranged from 45% for Asians and Pacific Islanders to 49% for blacks. For each of the younger adult age groups, whites consistently experienced a relatively smaller proportion of total stroke deaths.

Trends in Stroke Death Rates During 1991–1998

Although stroke death rates declined substantially in the 1970s and 1980s, the rate of decline slowed in the 1990s.²¹ Trend data presented in this publication indicate that stroke death rates for all racial and ethnic groups declined little in the 1990s for people ages 35 years and

Figure 1.2
Age Distribution of Stroke Deaths
Among People Ages ≥35 Years,
by Racial and Ethnic Group,
1991–1998

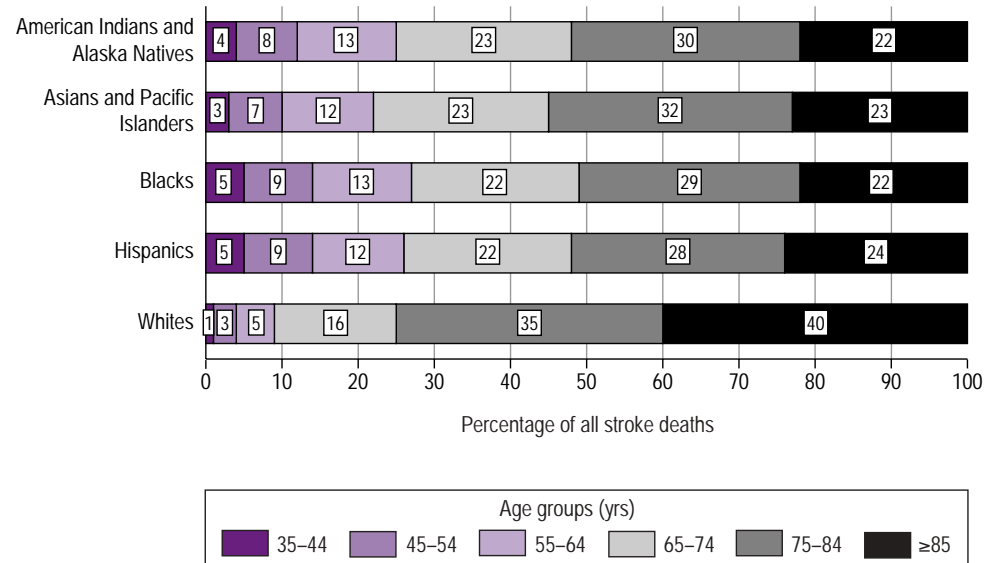
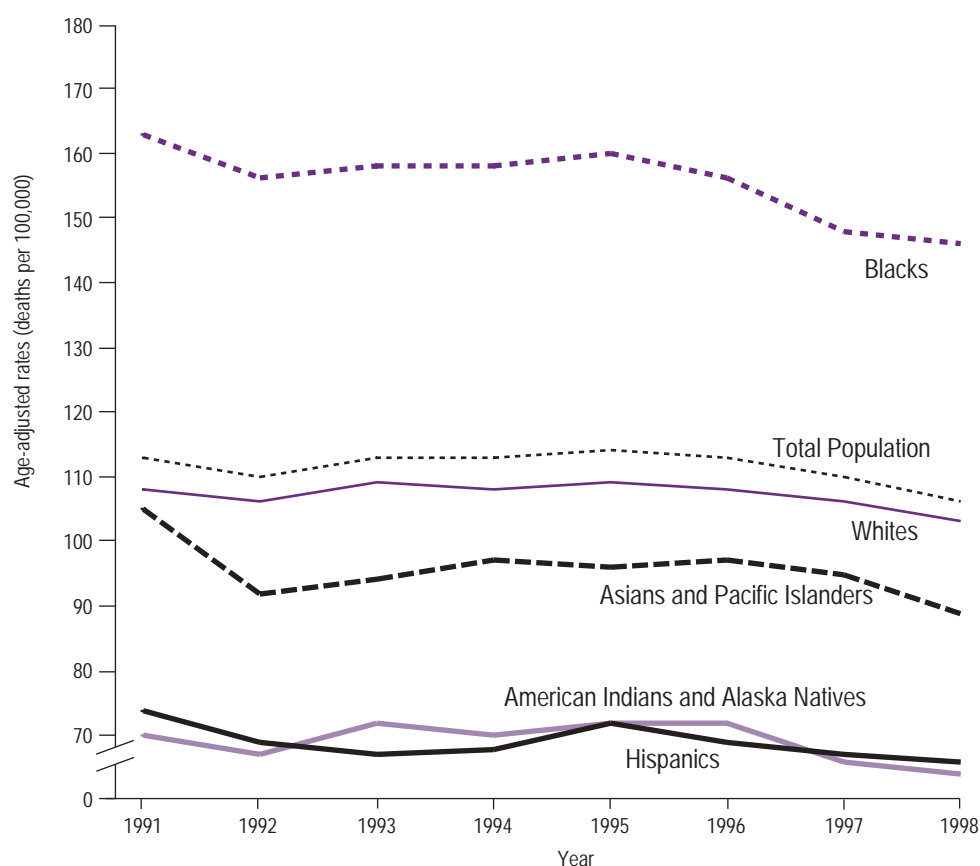


Figure 1.3
Trends in Stroke Death Rates
Among People Ages ≥ 35 Years,
by Racial and Ethnic Group,
1991–1998



older (Figure 1.3). On average, stroke death rates during 1991–1998 fell only 0.8% per year for all racial and ethnic groups combined. (The average annual percentage change in death rate was calculated by subtracting the 1991 rate from the 1998 rate, dividing by the 1991 rate, and then dividing by 7.) The largest declines were experienced by Asians and Pacific Islanders (2.0% per year),

followed by Hispanics and blacks (1.4% per year for both groups). American Indians and Alaska Natives experienced a decline of only 1.1% per year, and whites experienced a decline of 0.8% per year.

In addition, disparities in the level of stroke death rates among the five racial and ethnic groups were observed during 1991–1998 (Figure 1.3). African Americans experienced dramatically higher death rates than the other groups. Rates for whites were the next highest, followed by those for Asians and Pacific Islanders. Hispanics and American Indians and Alaska Natives had the lowest rates, and their rates were similar. Throughout this period, the differences between the lowest rates (Hispanics, American Indians and Alaska Natives) and the highest rates (blacks) were more than twofold.

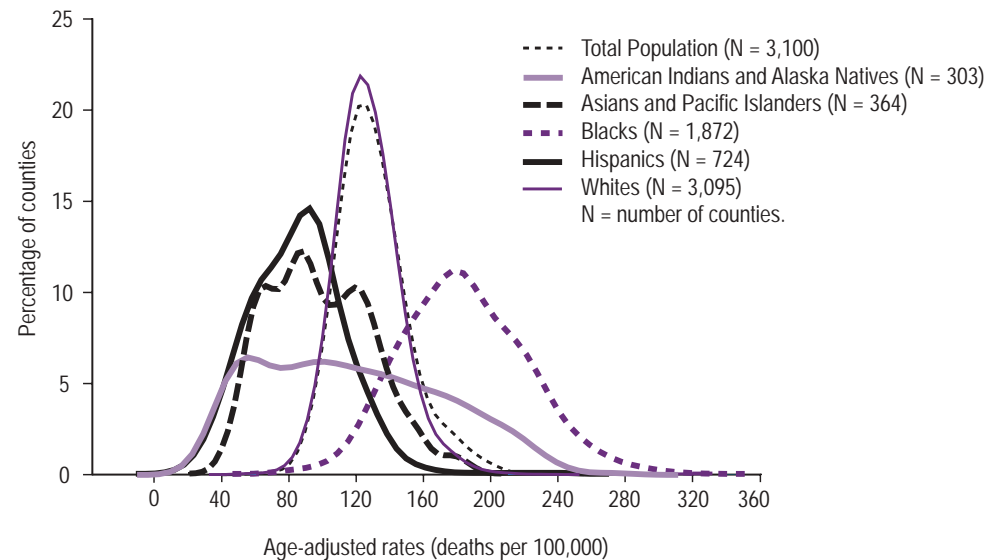
In 1998, stroke death rates for blacks were 2.1 times higher than the rates for Hispanics and American Indians and Alaska Natives, 1.6 times higher than the rates for Asians and Pacific Islanders, and 1.4 times higher than the rates for whites. However, as discussed previously, death rates for American Indians and Alaska Natives, Asians and Pacific Islanders, and Hispanics may be underestimated because of misreporting of race and ethnicity on death certificates. Furthermore, the relatively low stroke death rates for Asians and Pacific Islanders mainly reflect the mortality experience of Asians because Pacific Islanders make up only 5% of this population. Mortality studies conducted in the 1980s and 1990s reported that stroke death rates among Native Hawaiians were higher than those among Chinese, Filipino, and Japanese people living in Hawaii.^{22,23}

County Variations in Stroke Death Rates

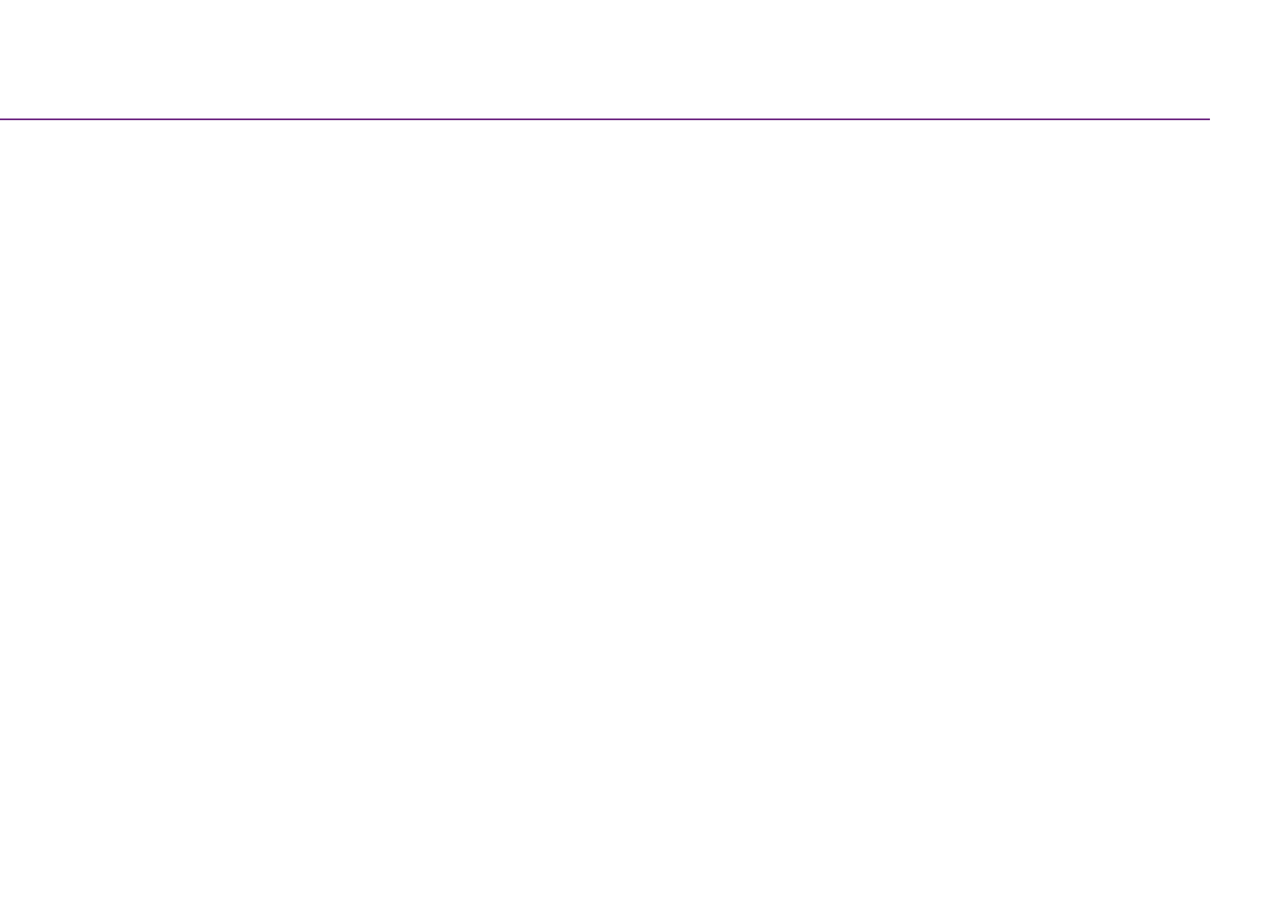
County distributions of stroke death rates highlight the geographic disparities in the burden of stroke for each racial and ethnic group during 1991–1998 (Figure 1.4). Examination of the tails of the distributions suggests there is little overlap in the county rates for Hispanics and African Americans. In other words, the highest county stroke death rates for Hispanics were among the lowest for blacks. For whites, the high end of the distribution tail is near the midpoint in the distribution of county rates for African Americans.

The peaks in each distribution's graph indicate the most common county stroke death rates for the corresponding racial or ethnic group. The distribution of county stroke death rates for American Indians and Alaska Natives is much broader than for other groups, with no clear peak. This distribution highlights the magnitude of the geographic variation in the burden of stroke across the many Tribal Nations that were combined into one category (i.e., American Indians and Alaska Natives), given current procedures for reporting race and ethnicity on death certificates.

Figure 1.4
Frequency Distribution of Smoothed
County Stroke Death Rates
Among People Ages ≥ 35 Years,
by Racial and Ethnic Group,
1991–1998



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Portrait of a father and his son.



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2 Reader's Guide to Understanding and Interpreting the Maps

We have designed the maps in the *Atlas of Stroke Mortality* to provide the reader with easy access to important information about the geographic distribution of stroke mortality among diverse racial and ethnic groups.

Stroke Mortality Maps

This publication includes maps of stroke death rates for the nation as a whole and for each individual state. The national maps illustrate the broadscale geographic patterns of stroke mortality for each racial and ethnic group and enable the reader to compare any region, state, or county with other parts of the country. The state maps allow the reader to identify areas with high rates and areas with low rates within each state for each racial and ethnic group.

National Maps

The *Atlas of Stroke Mortality* includes 18 national maps of stroke mortality. Section 3 presents maps for the total U.S. population and for each of the five largest racial and ethnic groups—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. It also presents separate maps for all women and all men, along with maps for women and men in the five racial and ethnic groups.

The national maps depict stroke death rates for each county. The death rates have been spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details about spatial smoothing.

For each map, the spatially smoothed county death rates were ranked from highest to lowest and then categorized into quintiles. The legend beneath each map indicates the

range of county rates, as well as the actual number of counties in each quintile. The maps also use a graded color scheme to differentiate each quintile, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates. Counties for which insufficient data existed to calculate a rate are shaded gray.

Comparing Maps for Different Racial and Ethnic Groups

Because the range of stroke death rates varied substantially by racial and ethnic group, the quintile cutpoints are different for each of the national maps. The range of values represented by a given quintile also varies from map to map. Therefore, comparisons of the spatial patterns of stroke mortality across the maps enable the reader to observe the locations of counties with the highest and lowest rates for each racial and ethnic group. To determine whether the mortality rates were absolutely higher or lower for one racial or ethnic group than for another, the reader must study the legends of the relevant maps and compare the cutpoints. Making a mental note of the range of county rates for each group when comparing geographic patterns across maps will be helpful.

State Maps

In Section 4, state maps present the smoothed county stroke death rates for the entire population in that state. These maps are accompanied by tables of state-specific information on the burden of stroke for each racial and ethnic group by gender. State maps of the geographic disparities within each racial and ethnic group are not included in this publication but are available on the CDC interactive Web site (www.cdc.gov/cvh/maps).

To create the state maps of stroke mortality, we used the same spatially smoothed stroke death rates generated for the national maps. A description of the methods used to calculate the rates can be found in Appendix B. Each county rate is based on a spatial moving average of that county and its neighbors. Therefore, for counties that are located along state borders, neighboring counties in adjacent states contributed to the smoothed rate for those counties, even though the neighboring counties are not displayed on the state map.

For each map, the smoothed county death rates within each state were ranked from highest to lowest and then categorized into quintiles. The legend beneath each map indicates the range of county rates, as well as the actual number of counties in each quintile. The maps also use a graded color scheme to differentiate each quintile, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates. Counties for which insufficient data existed to calculate a rate are shaded gray.

One important difference between the national and state maps is that the quintiles used for the national maps were derived from the range of stroke death rates that occurred among counties across the United States. Consequently, on a national map, all counties in a particular state could fall into the same quintile and be the same color. For the state maps, however, we derived quintiles based only on the smoothed stroke death rates for counties within a particular state. Therefore, each state map presents counties in all quintiles.

State Tables

For each state, tables are included that display summary data by racial and ethnic group for women and men separately as well as for the state population as a whole. Each table provides state data regarding population size and stroke death rate, along with the corresponding national stroke death rate. Under the federal data-reporting scheme, “Hispanic” is considered a designation of ethnicity, not race. Therefore, data for Hispanics are presented twice in the state tables and throughout the *Atlas of Stroke Mortality*—once under the category of “Hispanics,” which includes Hispanics of all racial identities (e.g., Hispanic blacks, Hispanic whites), and again under any of the four racial categories (American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and whites) according to a person’s racial identity. Consequently, data for the five racial and ethnic groups are not mutually exclusive.

Map Projections

National Maps

For the contiguous 48 states, we chose Albers Conic Equal Area, a map projection that preserves the accurate presentation of relative area and thus enhances comparison of one county with another. Alaska was projected using Miller’s Cylindrical to provide a suitable orientation on the overall layout. Hawaii was presented using geographic coordinates (latitude and longitude) because of its shape and orientation. The District of Columbia and New York City were also presented using geographic coordinates.

State Maps

All states were projected using the State Plane coordinate system. Every state has a separate, official State Plane system of map projections based on the shape and orientation of the state. Each system has a standard projection or series of projections based on the Transverse Mercator or Lambert's Conformal Conic projection. For states with multiple State Plane zones, we used the central zone or the zone that caused minimal distortion to the state as a whole.

Map Scales

National Maps

Scale is the number of distance units on the earth represented by one distance unit on a map. Scale is a dimensionless ratio and can therefore be expressed in any set of distance units (e.g., miles, kilometers, inches, centimeters). Each national map of stroke mortality presented in this publication actually encompasses five separate maps, each displayed at a different scale, so the

entire United States fits on one page. Alaska and Hawaii are displayed as insets, with Alaska presented at a smaller scale than the map of the contiguous 48 states because of its larger land area. Hawaii, the District of Columbia, and New York City are displayed at larger scales because of their relatively small land areas. Because these maps were not designed for displaying or measuring distances, we did not provide exact linear scales.

State Maps

The state maps used different scales to maximize the size of the state image presented. In other words, states with small land areas were mapped at a larger scale than those with larger land areas. When making comparisons among states, the reader should recognize that the same unit length on the pages for two maps may denote different lengths on the ground. Using the national map as a point of reference will be useful. Because these maps were not designed for displaying or measuring distances, we did not provide exact linear scales.

A Detroit woman listens to South African political
activist Nelson Mandela speak in June 1990
shortly after his release from prison.



© Jim West

3 National Maps of Stroke Mortality by Race, Ethnicity, and Gender

In this section, national geographic disparities in stroke death rates are presented for the total U.S. population and for the five largest racial and ethnic groups in the United States—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. A map depicting rates for the total population of each racial and ethnic group is followed by separate maps for women and men in each group.

Each national map presents spatially smoothed, age-adjusted stroke death rates for counties across the United States. Hawaii, New York City, and the District of Columbia are displayed using a larger scale than the rest of the nation to enhance visualization of these areas. Alaska is shown using a smaller scale because of the large land area it occupies.

For American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and Hispanics, stroke death rates

were not calculated for a majority of counties nationwide because of small population sizes and infrequent stroke deaths in these counties. If a county and its neighboring counties reported fewer than 20 stroke deaths for a specific racial or ethnic group during 1991–1998, then a rate was not calculated for that county (see Appendix B for more details).

For part of the study period, Oklahoma and New Hampshire did not collect data on Hispanic origin on death certificates. Consequently, we were unable to report stroke death rates for Hispanics in those states. During 1991–1993 in New York City, Hispanic origin was recorded as “unknown” on approximately 18% of stroke death certificates for people ages 35 and older. Therefore, the stroke death rates for Hispanics in New York City may be underestimated.

Total Population

The age-adjusted stroke death rate for U.S. residents ages 35 and older was 121/100,000 during 1991–1998. Stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The national map of age-adjusted, spatially smoothed stroke death rates for the total U.S. population shows considerable geographic disparity across the 3,100 counties for which data were available. County death rates ranged from 61 to 241/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (194) and the midpoint of the lowest quintile (87). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for the total population (Figure 3.1). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

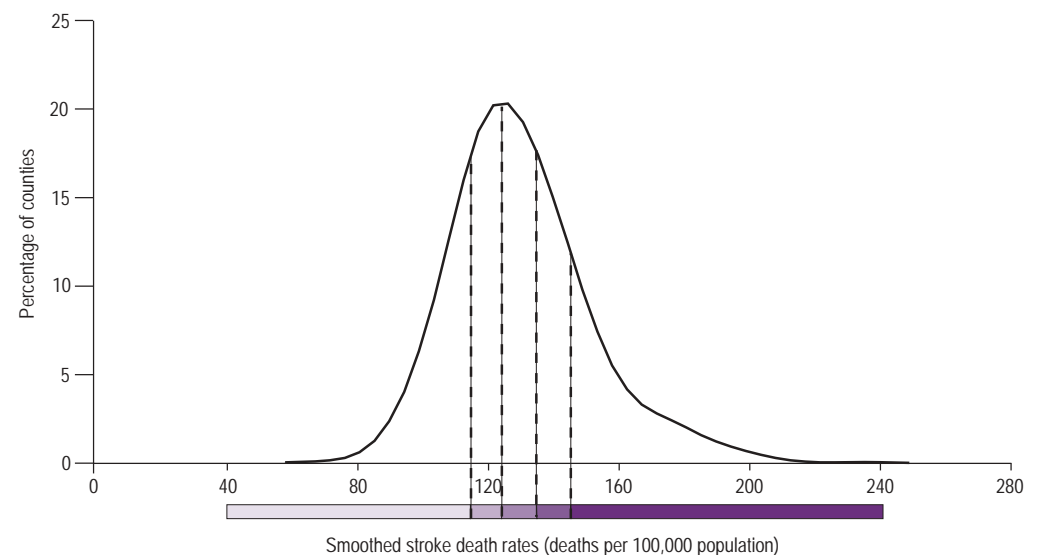
The map for the total population indicates that a majority of the counties in the southeastern states (except Florida) were in the top 40% of stroke death rates. The overall pattern shows that nearly all of the counties in the highest quintile were reported in two areas of the Southeast. The first area covers vast expanses of southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia), as well as part of Alabama. The second area encompasses Mississippi Delta counties in Tennessee, Arkansas, Mississippi, Louisiana, and the southeastern “bootheel” area of Missouri. A separate pocket of counties with high rates was observed in the Pacific Northwest, namely Washington, Oregon, and northern California. Counties in the lowest quintile were reported primarily in the Southwest, the Great Plains, the Northeast, and southern Florida.

All Women and All Men

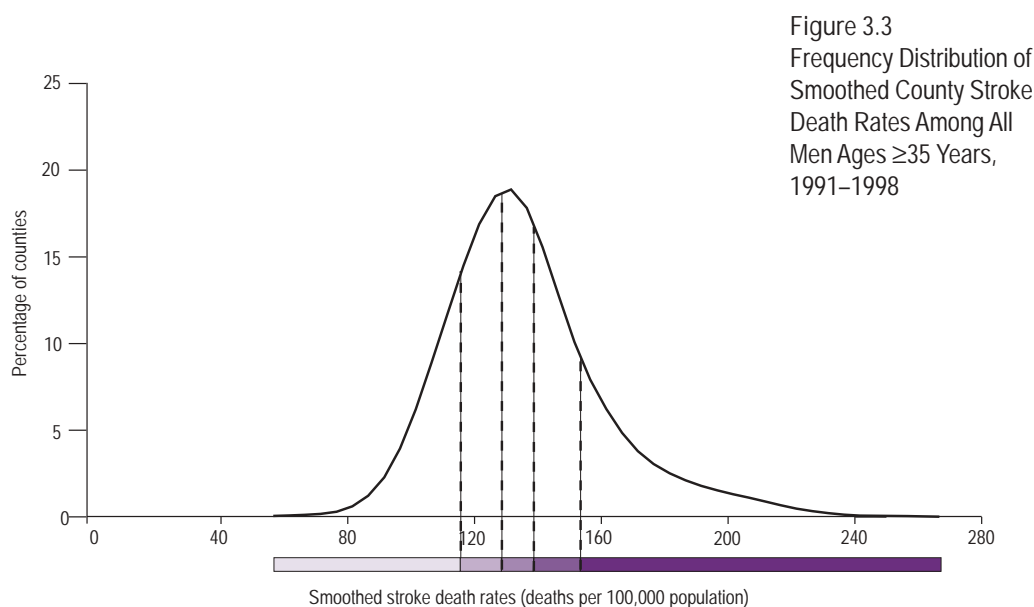
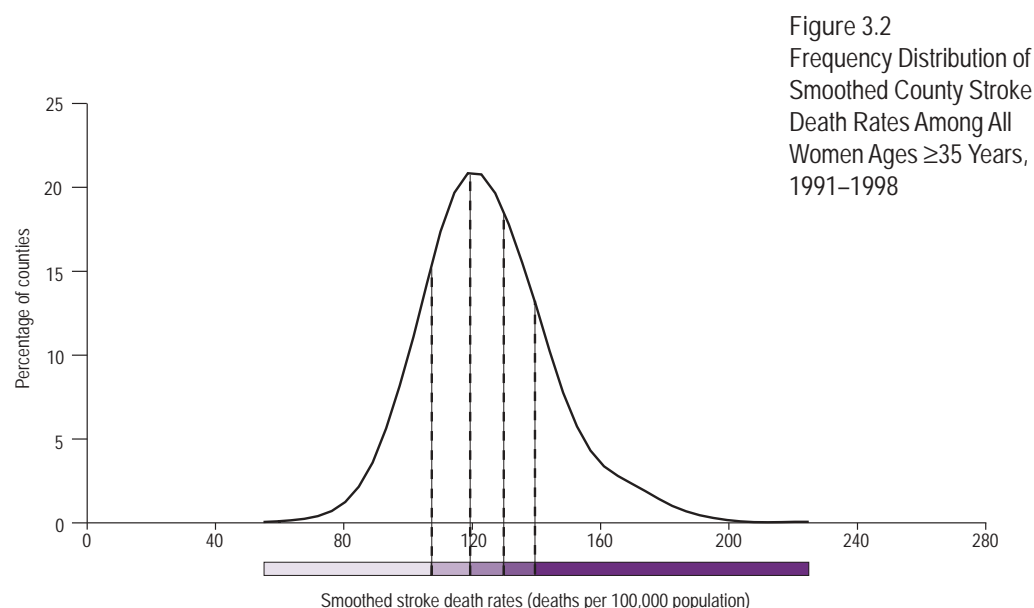
During 1991–1998, the age-adjusted death rate for stroke was 117/100,000 for women and 126/100,000 for men ages 35 and older. For both women and men, stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The maps of age-adjusted, spatially smoothed stroke death rates for women and men show considerable geographic disparity. For women, county death rates ranged from 58 to 226/100,000. The range for men was 60 to 258/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 206 for men) and the midpoint of the lowest quintile (84 for women, 88 for men).

Figure 3.1
Frequency Distribution of
Smoothed County Stroke
Death Rates Among All
People Ages ≥35 Years,
1991–1998



Stroke Mortality: Total Population



The frequency distributions show the range of smoothed stroke death rates for women (Figure 3.2) and for men (Figure 3.3).

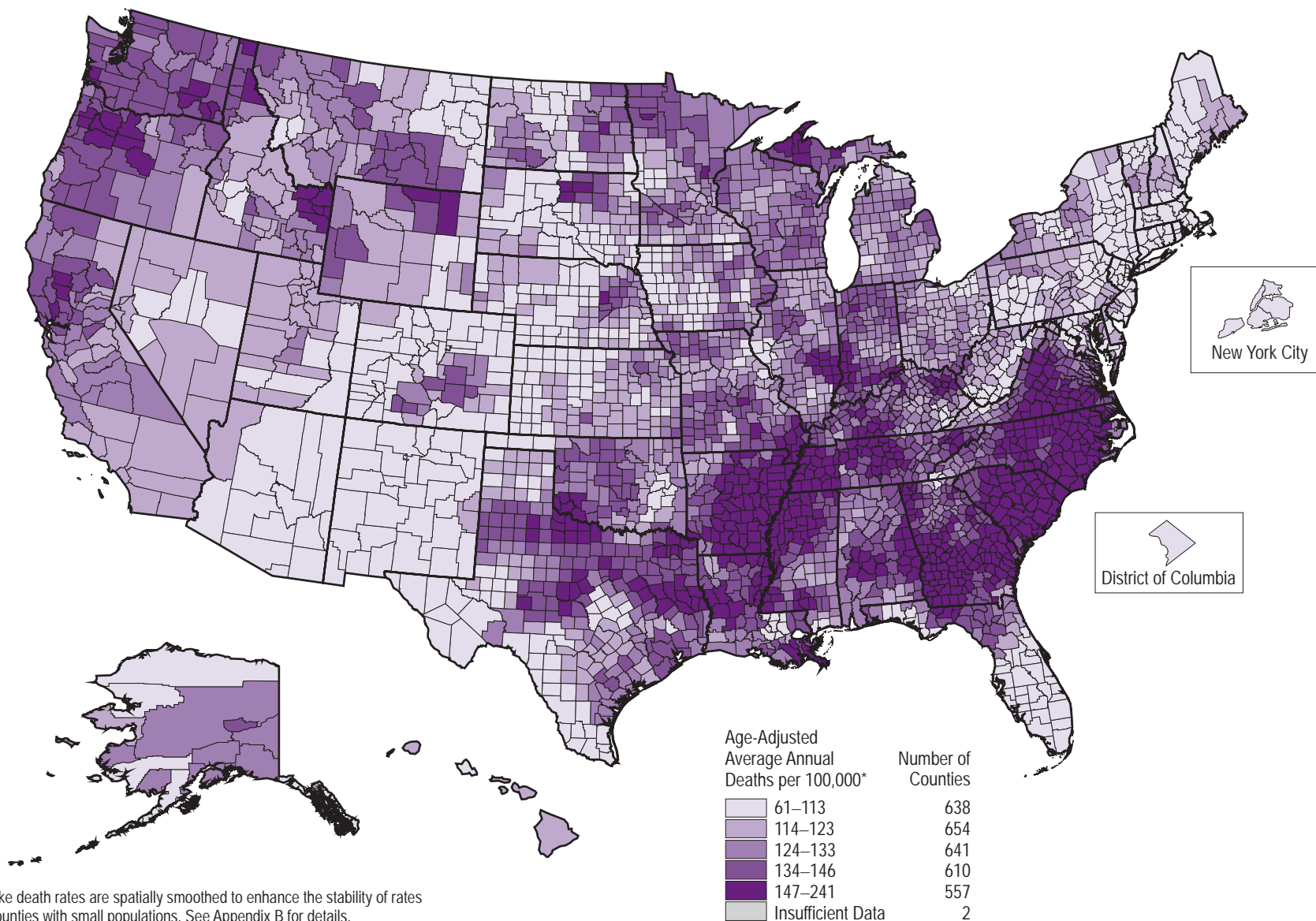
The maps indicate that for both women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For women, a pocket of counties with high rates extended from the western portion of Montana westward and southward through much of California. For men, a concentration of counties with high rates was observed in North Dakota, South Dakota, and other sections of the Midwest.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates 1991–1998

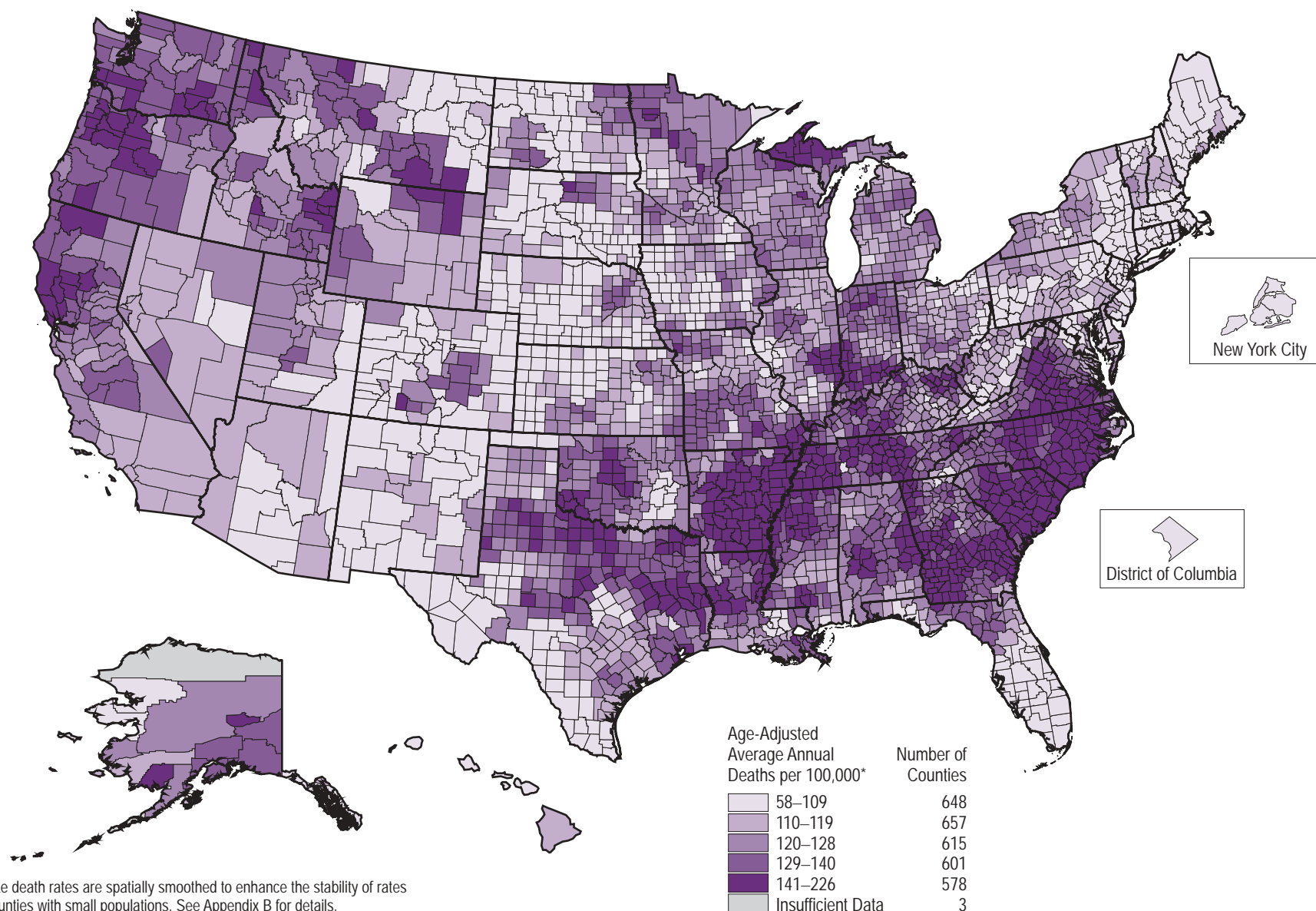
Total Population
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

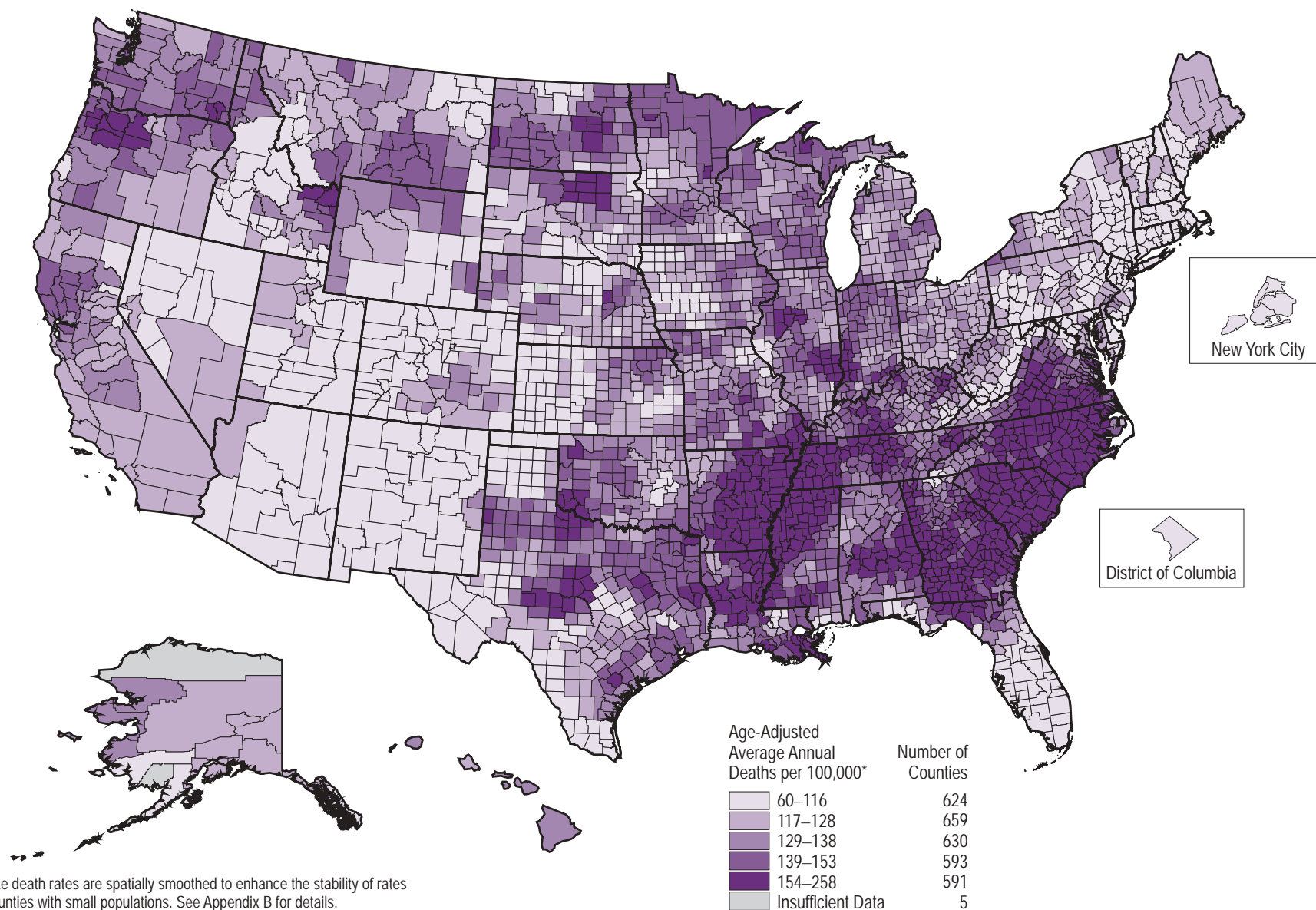
Smoothed County Stroke Death Rates 1991–1998

All Women
Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

All Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

American Indians and Alaska Natives

American Indians and Alaska Natives made up 1.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for American Indians and Alaska Natives in this age group was 79/100,000. The American Indian and Alaska Native population in the United States is composed of many politically and culturally distinct Tribal Nations residing both in rural areas (including reservations with limited political sovereignty) and urban areas.

The national map of age-adjusted, spatially smoothed stroke death rates for all American Indians and Alaska Natives shows considerable geographic disparity across the 303 counties for which sufficient data existed to calculate rates. County death rates ranged from 29 to 272/100,000. A nearly fivefold difference existed between the midpoint of the highest quintile (222) and the midpoint of the lowest quintile (46). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for American Indians and Alaska Natives in all counties for which rates were calculated (Figure 3.4). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

The map suggests somewhat of a north-south gradient in stroke mortality among American Indians and Alaska Natives. Counties with high rates were reported primarily in the northern states of Alaska, Washington, Idaho, Montana, Wyoming, South Dakota, Wisconsin, and Minnesota. Counties with low rates were reported primarily in central Oklahoma (predominantly among members of the Cherokee Nation), southern California, Arizona, and New Mexico. Exceptions to the north-south gradient were high rates in counties along the North Carolina–South

Carolina border (where the Lumbee Indians reside), along the southern tip of Louisiana, and in Nevada.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 77/100,000 for American Indian and Alaska Native women and 80/100,000 for American Indian and Alaska Native men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for American Indian and Alaska Native women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For American Indian and Alaska Native women, county death rates ranged from 35 to 291/100,000. The range for American Indian and Alaska Native men was 33 to 291/100,000. For both women and men, a fivefold difference existed between the midpoint of the highest quintile (229 for women, 237 for men) and the midpoint of the lowest quintile (46 for women, 49 for men).

The frequency distributions show the range of smoothed stroke death rates for American Indian and Alaska Native

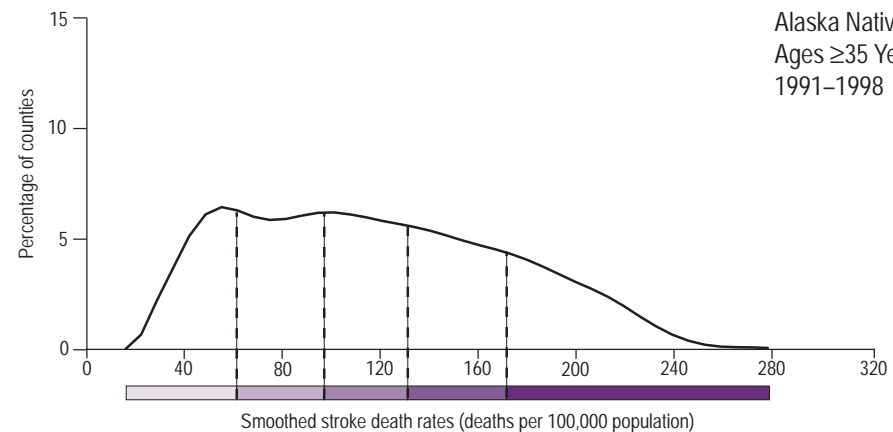


Figure 3.4
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indians and
Alaska Natives
Ages ≥35 Years,
1991–1998

Figure 3.5
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indian and
Alaska Native Women
Ages ≥ 35 Years,
1991–1998

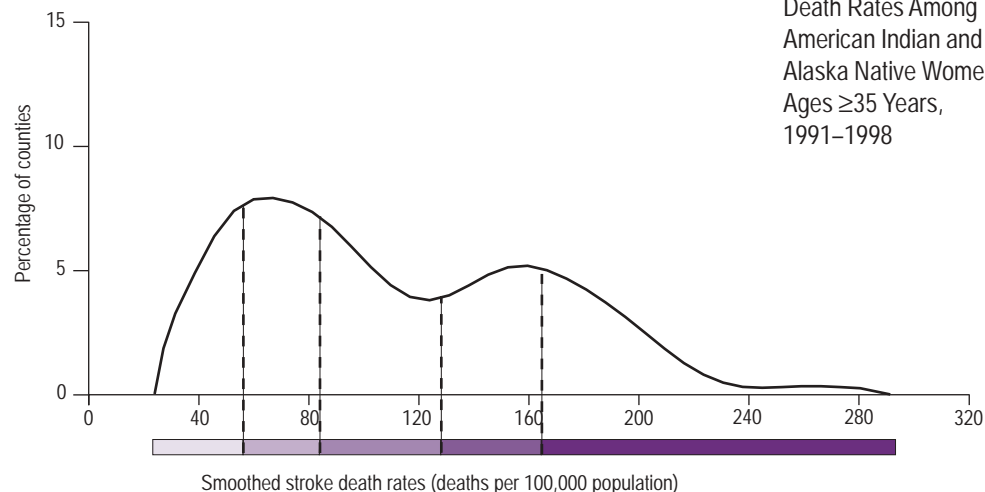
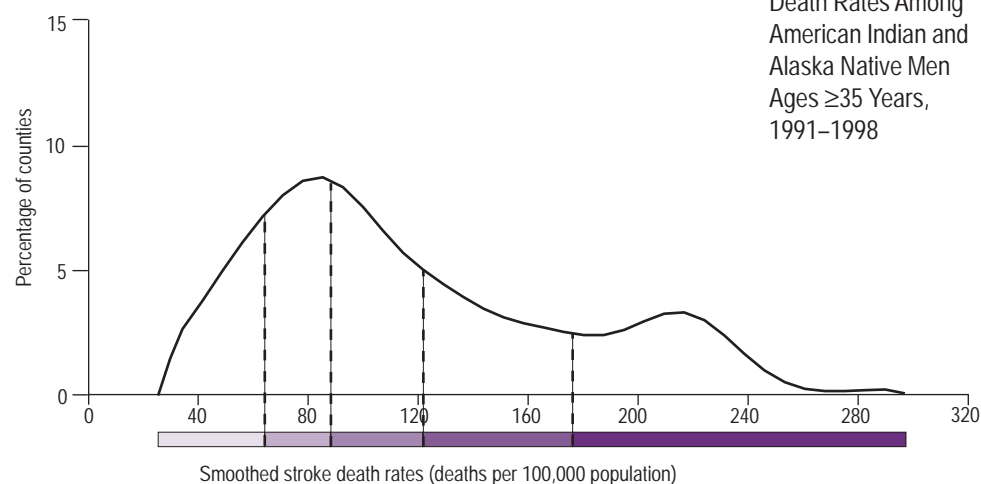


Figure 3.6
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indian and
Alaska Native Men
Ages ≥ 35 Years,
1991–1998



women (Figure 3.5) and men (Figure 3.6) in all counties for which rates were calculated.

The maps for women and men indicate slightly different geographic patterns than the pattern for the total population. This difference can be largely attributed to the small number of counties with sufficient data to calculate rates for women and men separately. The patterns for American Indian and Alaska Native women and men are similar, with groups of counties with high rates in Oregon, northern California, and Arizona.

A Note on Methods

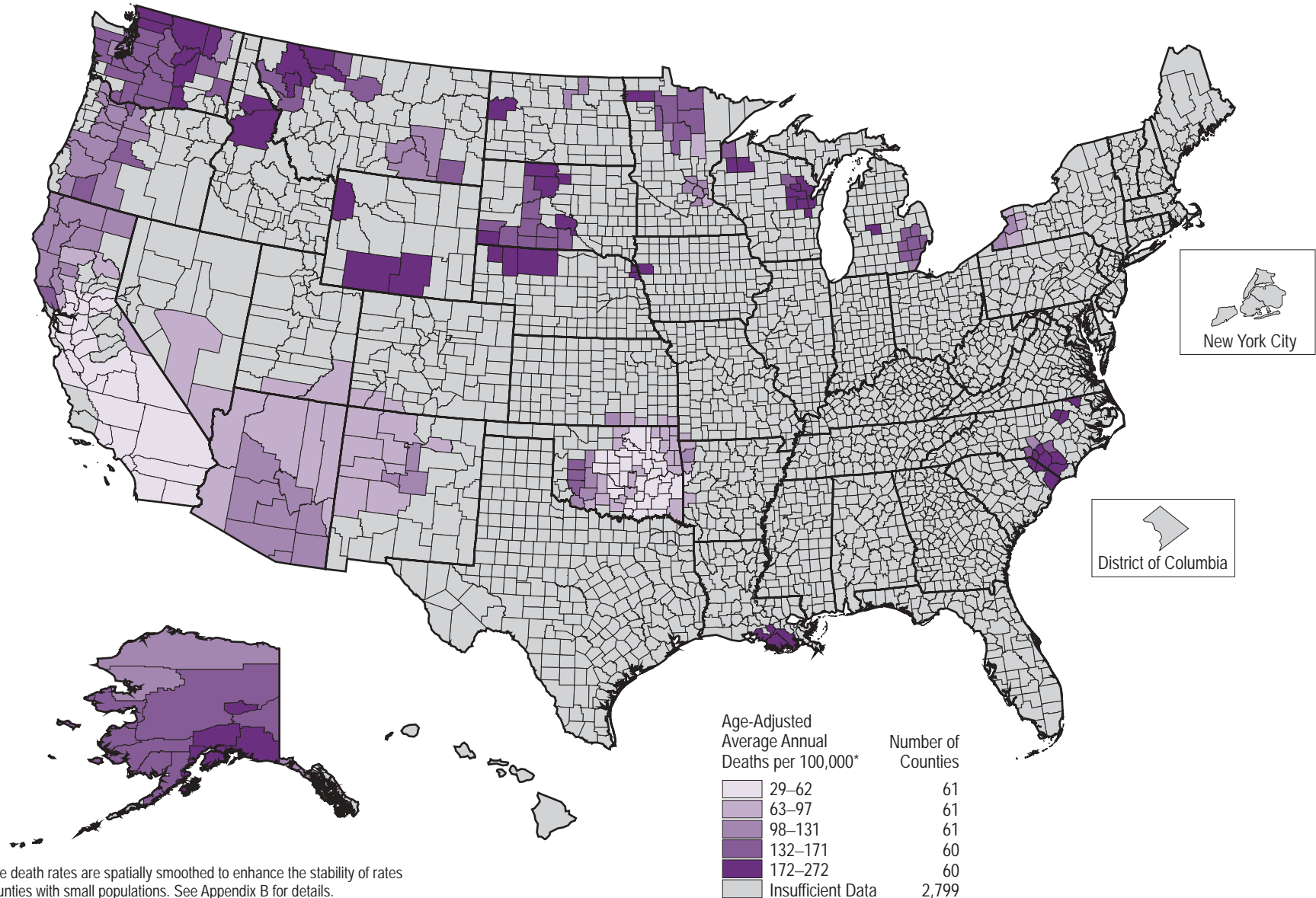
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for American Indians and Alaska Natives. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

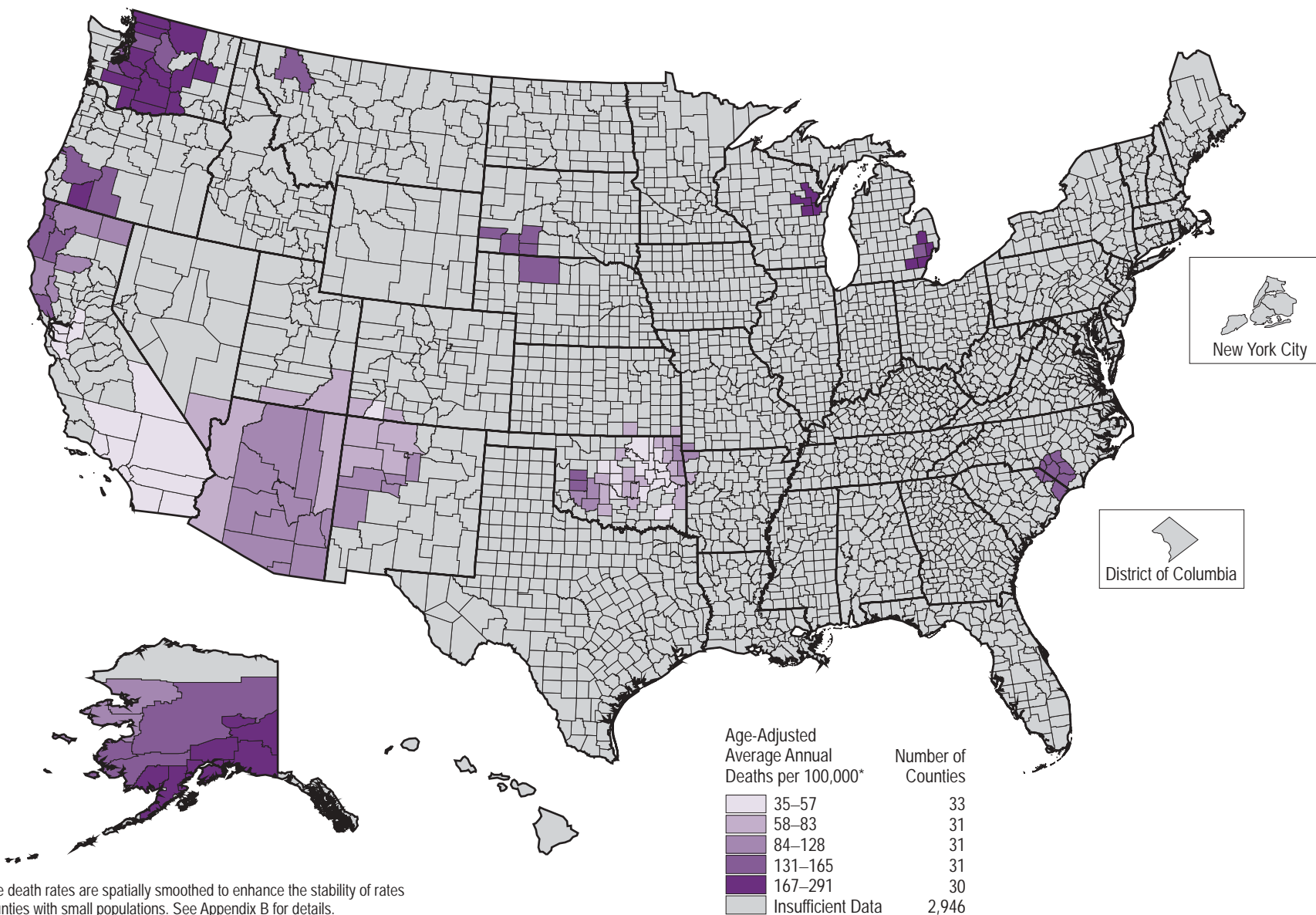
American Indians and Alaska Natives Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

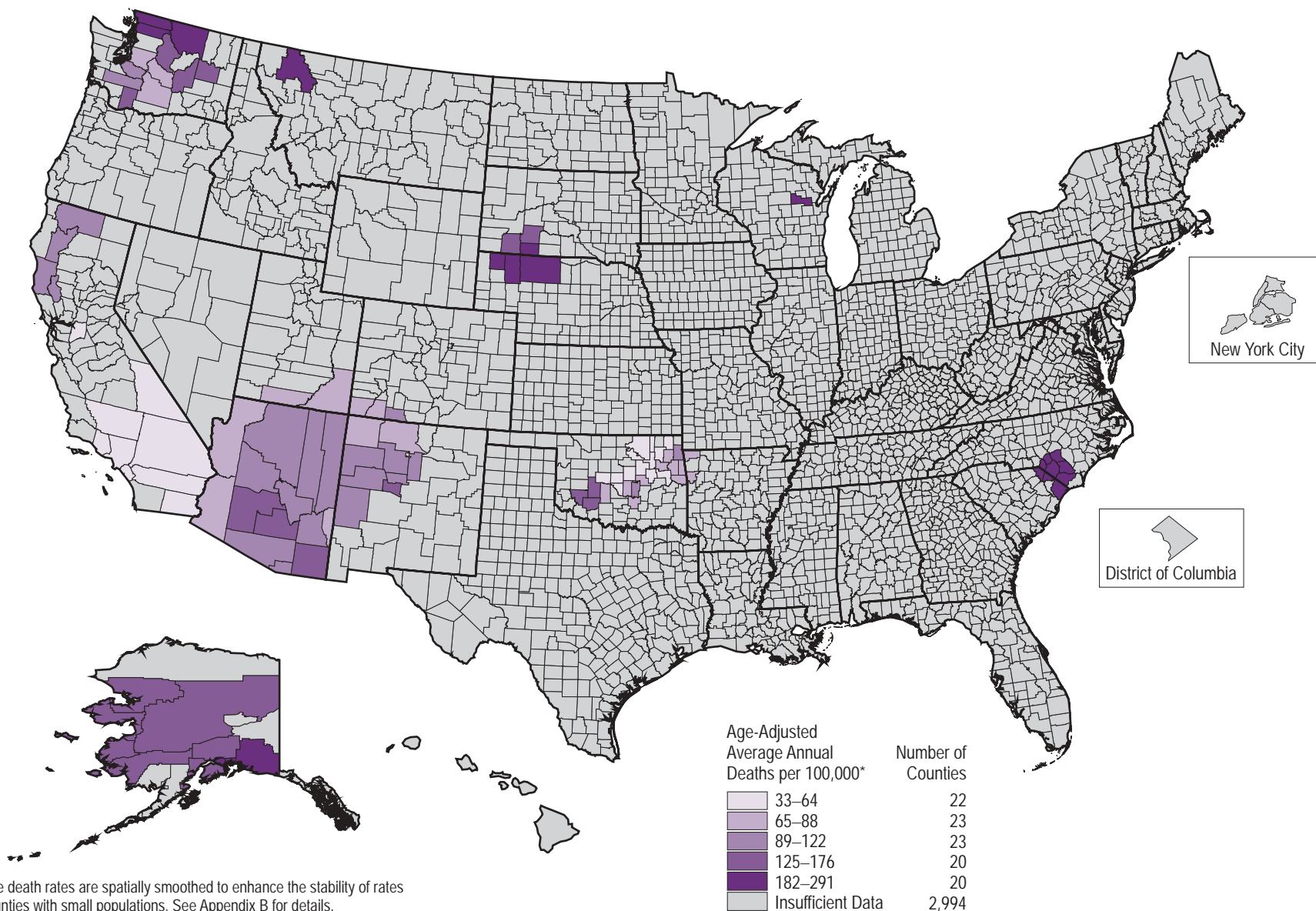
Smoothed County Stroke Death Rates 1991–1998

American Indian and Alaska Native Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

American Indian and Alaska Native Men Ages 35 Years and Older



Asians and Pacific Islanders

Asians and Pacific Islanders made up 4.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for Asians and Pacific Islanders in this age group was 105/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Asians and Pacific Islanders shows considerable geographic disparity across the 364 counties for which sufficient data existed to calculate rates. County death rates ranged from 43 to 184/100,000. A nearly threefold difference existed between the midpoint of the highest quintile (156) and the midpoint of the lowest quintile (56). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Asians and Pacific Islanders in all counties for which rates were calculated (Figure 3.7). The vertical dotted lines and graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

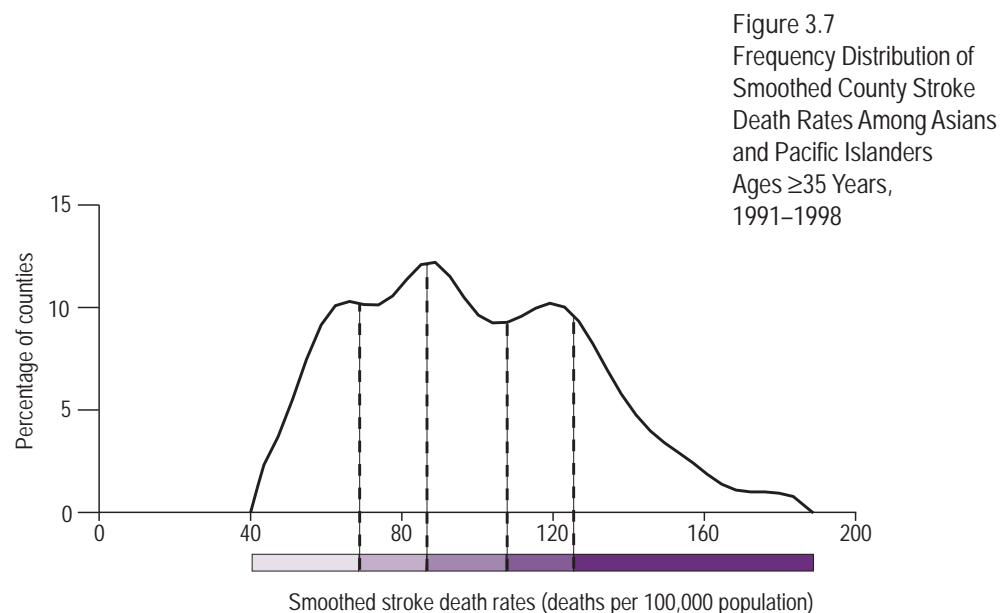
The map indicates a west-east gradient of stroke mortality among Asians and Pacific Islanders. Counties with the highest rates were reported in sections of Washington, Oregon, California, Nevada, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Memphis, Tennessee. Counties with the lowest rates were reported in the metropolitan areas of New York City, Philadelphia, Chicago, Miami and other parts of southern and middle Florida, and New Jersey.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 96/100,000 for Asian and Pacific Islander women and 118/100,000 for Asian and Pacific Islander men ages 35 and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Asian and Pacific Islander women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Asian and Pacific Islander women, county death rates ranged from 33 to 237/100,000. The range for Asian and Pacific Islander men was 40 to 209/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (178 for women, 176 for men) and the midpoint of the lowest quintile (54 for women, 61 for men).

The frequency distributions show the range of smoothed stroke death rates for Asian and Pacific Islander women



Stroke Mortality: Asians and Pacific Islanders

Figure 3.8
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Asian
and Pacific Islander
Women Ages ≥35 Years,
1991–1998

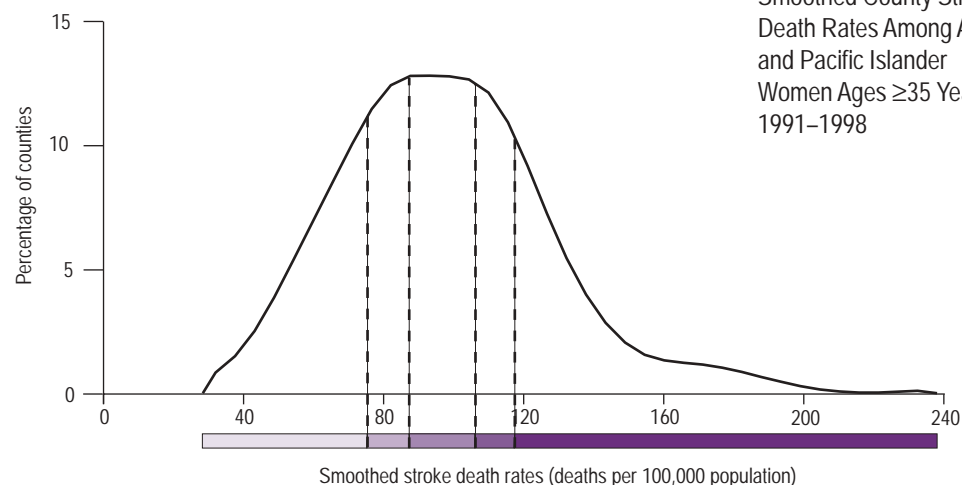
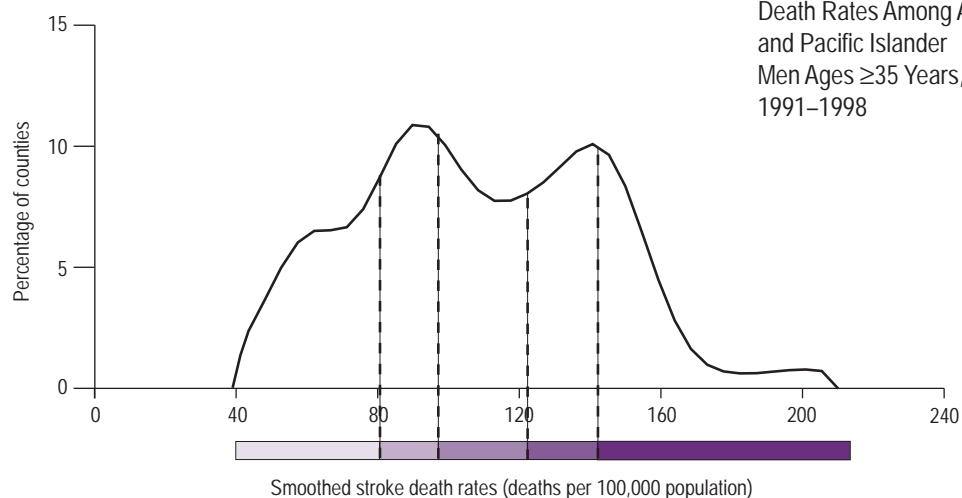


Figure 3.9
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Asian
and Pacific Islander
Men Ages ≥35 Years,
1991–1998



(Figure 3.8) and men (Figure 3.9) in all counties for which rates were calculated.

The maps indicate a west-east gradient of stroke mortality for both Asian and Pacific Islander women and men. Counties with the highest rates were reported primarily in sections of Washington, Oregon, California, Nevada, Utah, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Dallas, Texas.

A Note on Methods

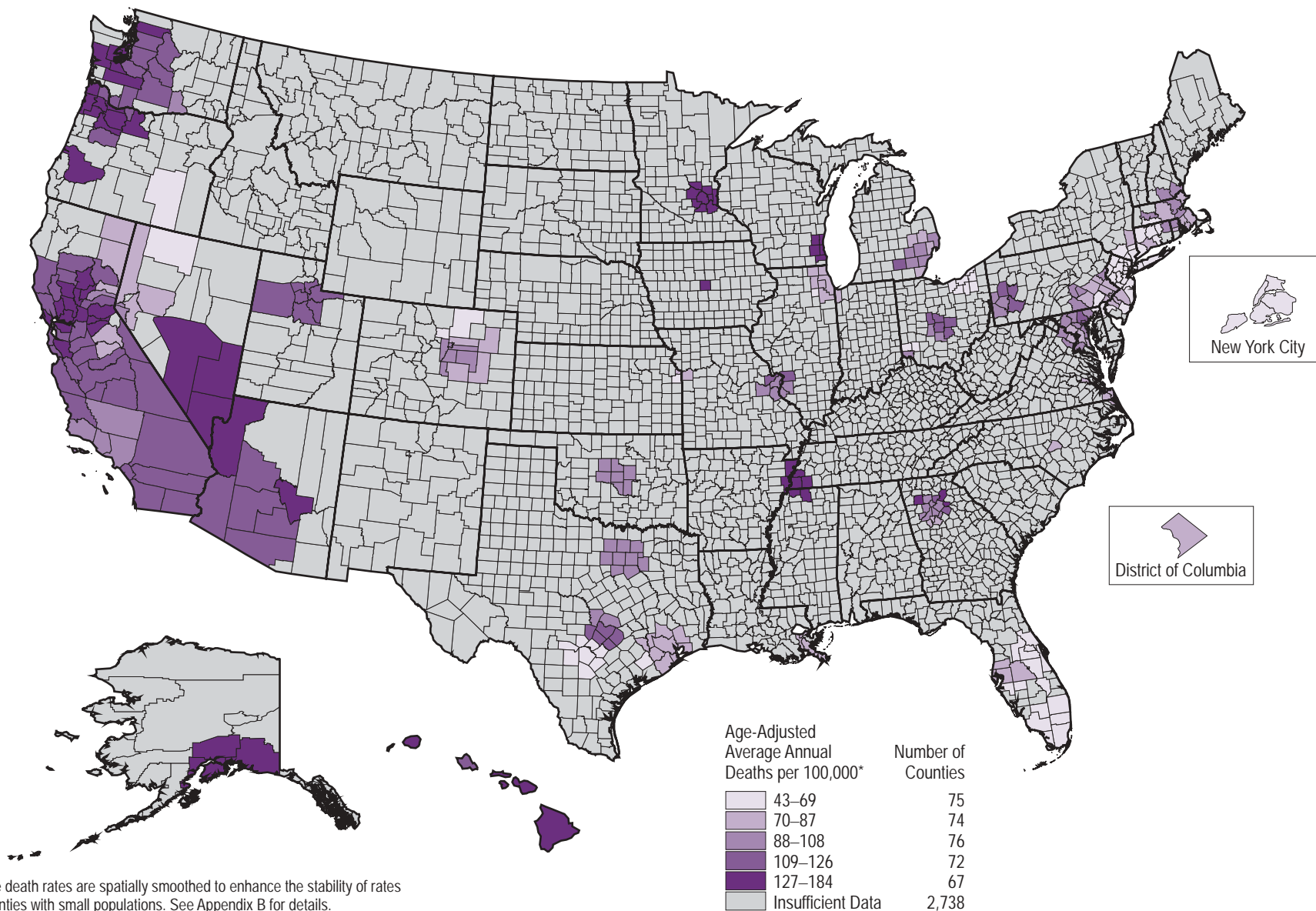
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Asians and Pacific Islanders. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

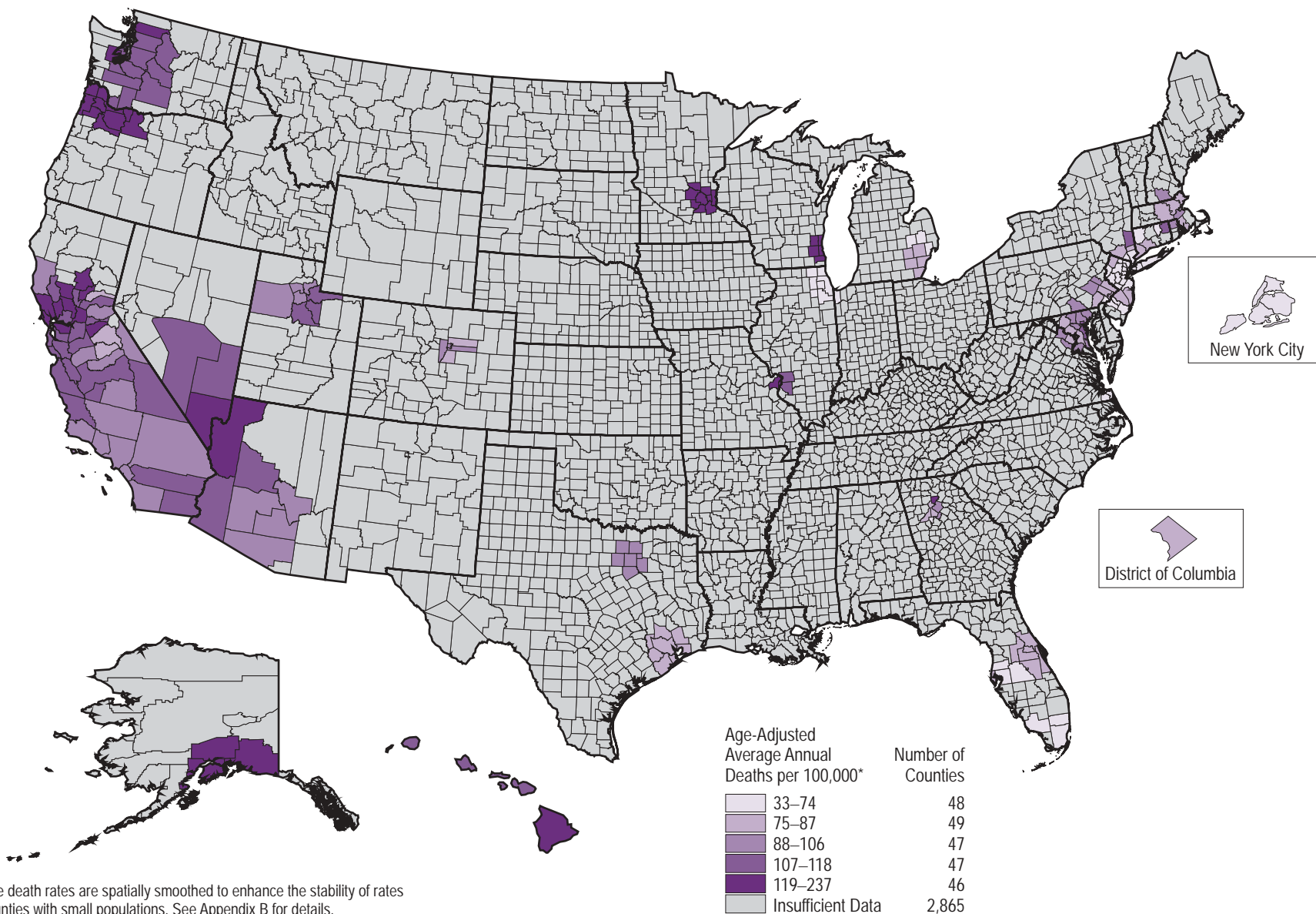
Asians and Pacific Islanders Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

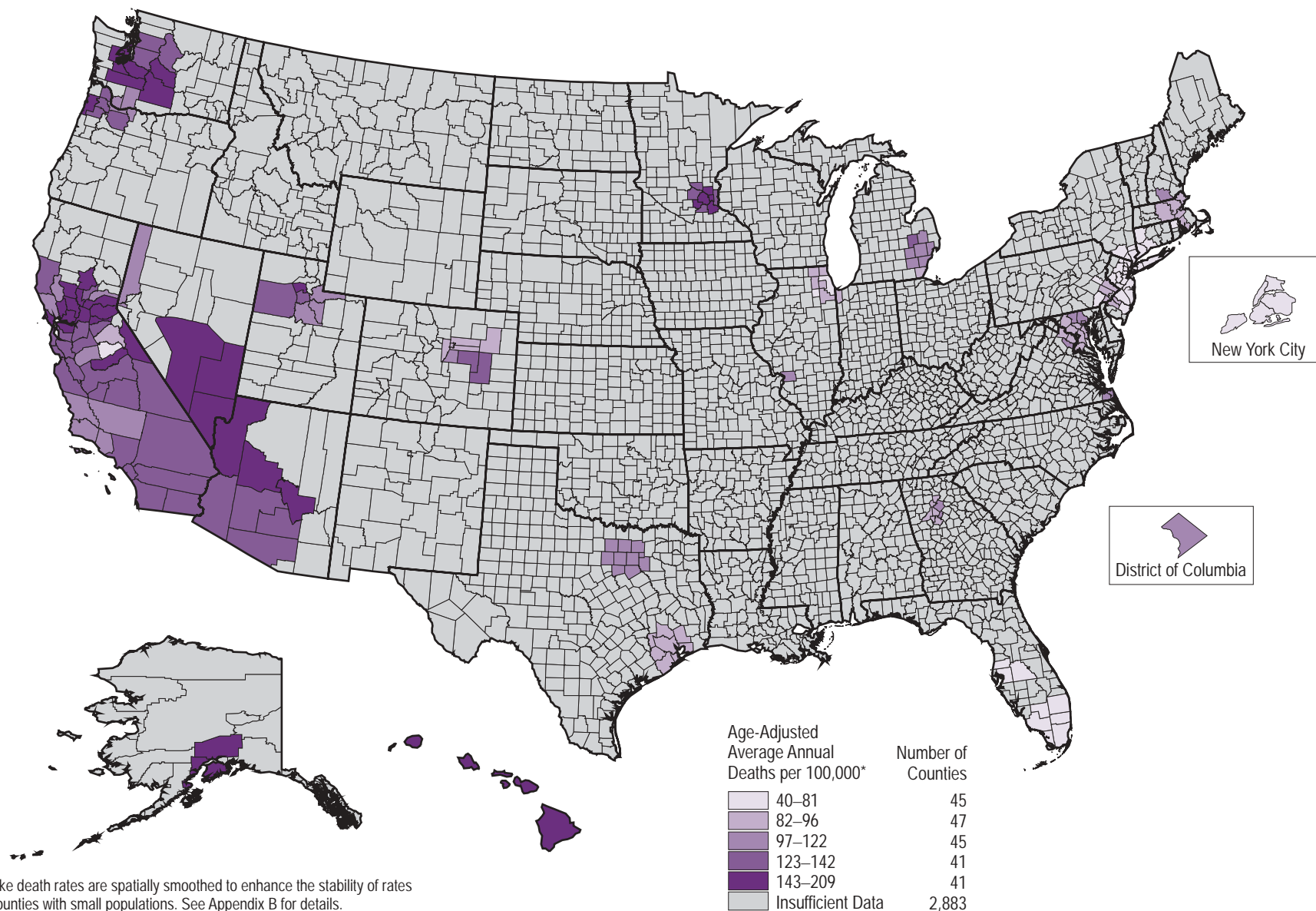
Smoothed County Stroke Death Rates 1991–1998

Asian and Pacific Islander Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

Asian and Pacific Islander Men Ages 35 Years and Older



Blacks

Blacks were the largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.9% of all residents. During 1991–1998, the age-adjusted stroke death rate for blacks in this age group was 166/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all blacks shows considerable geographic disparity across the 1,872 counties for which sufficient data existed to calculate rates. County death rates ranged from 74 to 311/100,000. A greater than twofold difference existed between the midpoint of the highest quintile (261) and the midpoint of the lowest quintile (111). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for blacks (Figure 3.10). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

According to the map, the highest stroke death rates for blacks were reported in counties located primarily in two regions of the Southeast. The first region includes nearly the entire state of South Carolina, much of North Carolina, and many of the southern, rural Georgia counties of the Cotton Belt. The second region is the Mississippi River Valley and Delta, specifically counties in Arkansas, western Mississippi, and western Tennessee. Smaller groupings of counties in the highest quintile were also observed in northeastern Texas, northwestern Illinois, and along the Washington–Idaho border. Counties with low rates were reported primarily in the southwestern states of Nevada, Arizona, and New Mexico, along with parts of the Northeast. Several metropolitan areas had stroke death

rates in the lowest quintile, including Boston, the District of Columbia, New York City, and Philadelphia.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 153/100,000 for black women and 182/100,000 for black men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for black women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For black women, county death rates ranged from 70 to 302/100,000. The range for black men was 84 to 404/100,000. For both women and men, a greater than twofold difference existed between the midpoint of the highest quintile (249 for women, 322 for men) and the midpoint of the lowest quintile (105 for women, 124 for men).

Figure 3.10
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Blacks
Ages ≥ 35 Years,
1991–1998

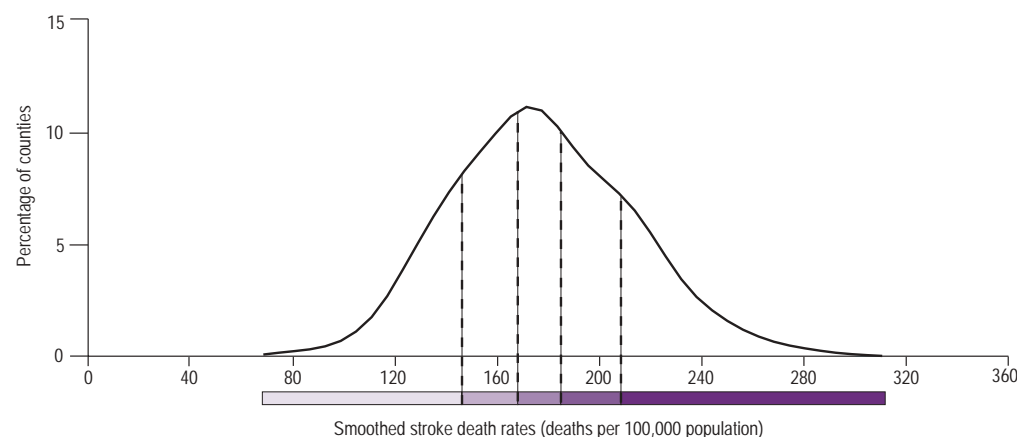
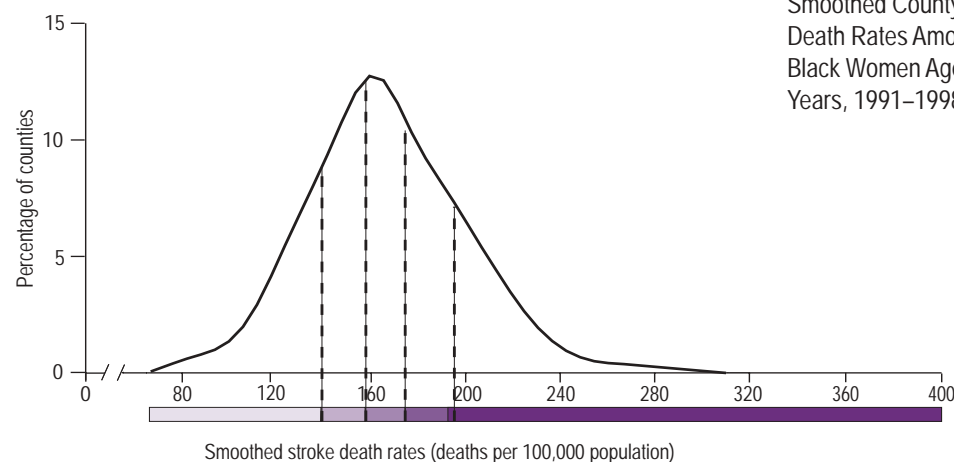


Figure 3.11
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
Black Women Ages ≥35
Years, 1991–1998



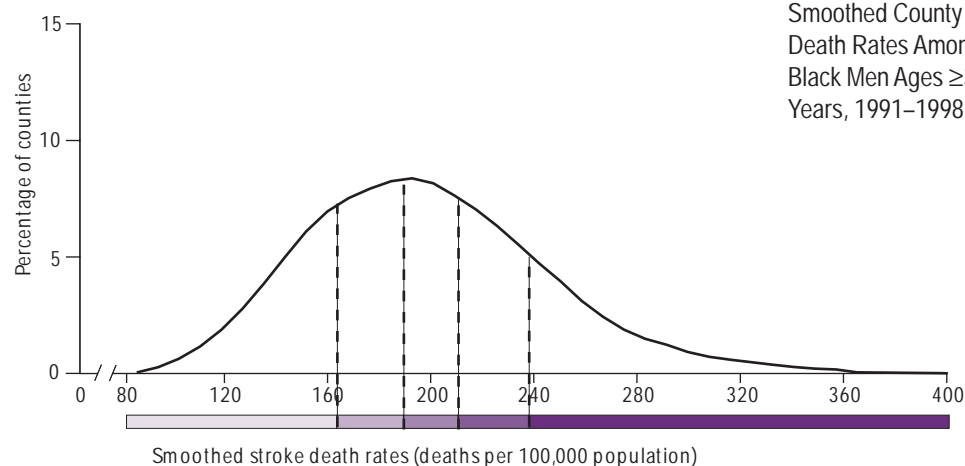
The frequency distributions show the range of smoothed stroke death rates for black women (Figure 3.11) and men (Figure 3.12) in all counties for which rates were calculated.

The maps indicate that for both black women and men, a majority of the counties in the southeastern states were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, Georgia, and Florida) and parts of the Mississippi Delta (as far east as Alabama) had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the western states. California, Arizona, Nevada, and Washington showed more counties in the top two quintiles for black women than for black men.

A Note on Methods

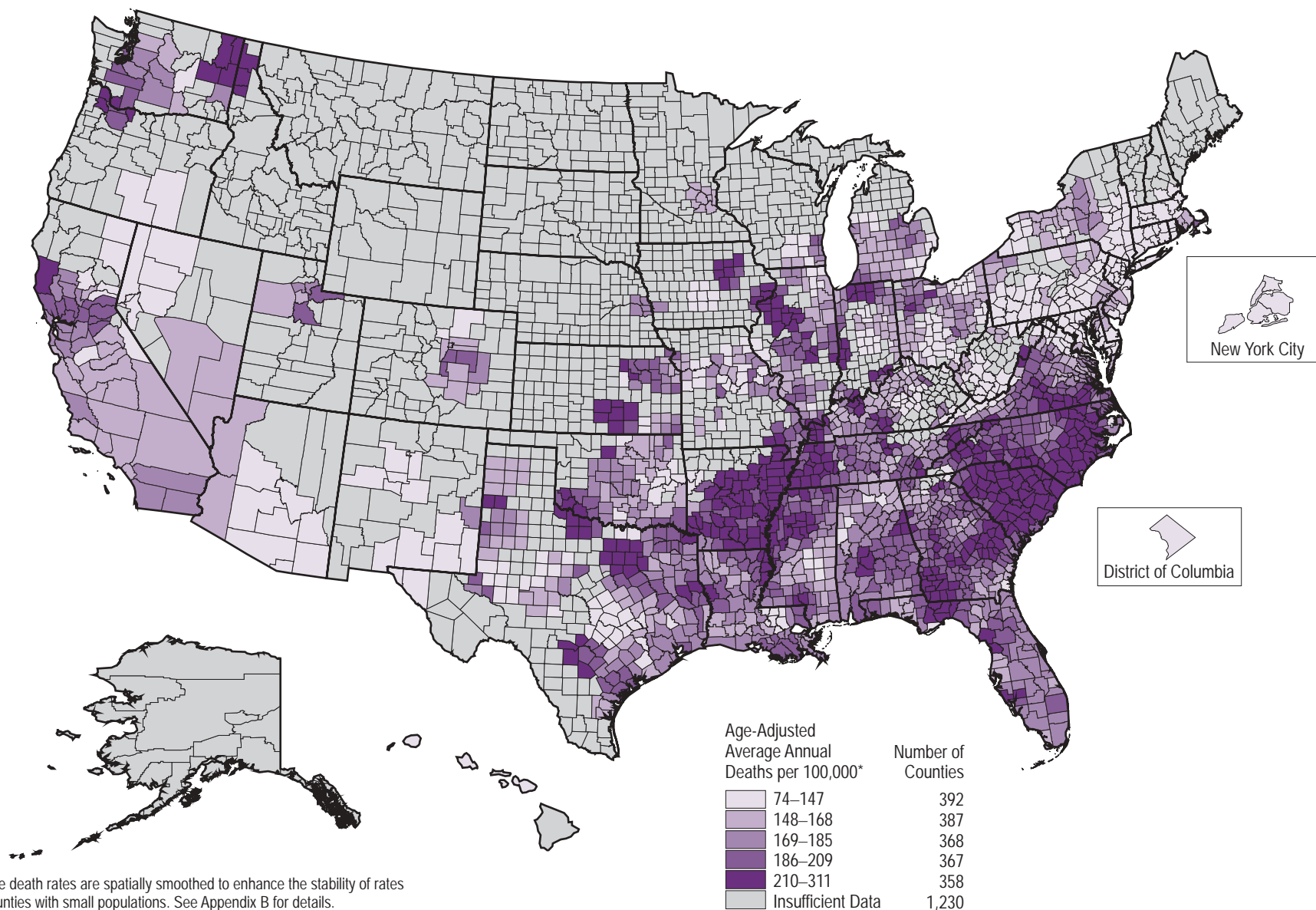
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Figure 3.12
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
Black Men Ages ≥35
Years, 1991–1998



Smoothed County Stroke Death Rates 1991–1998

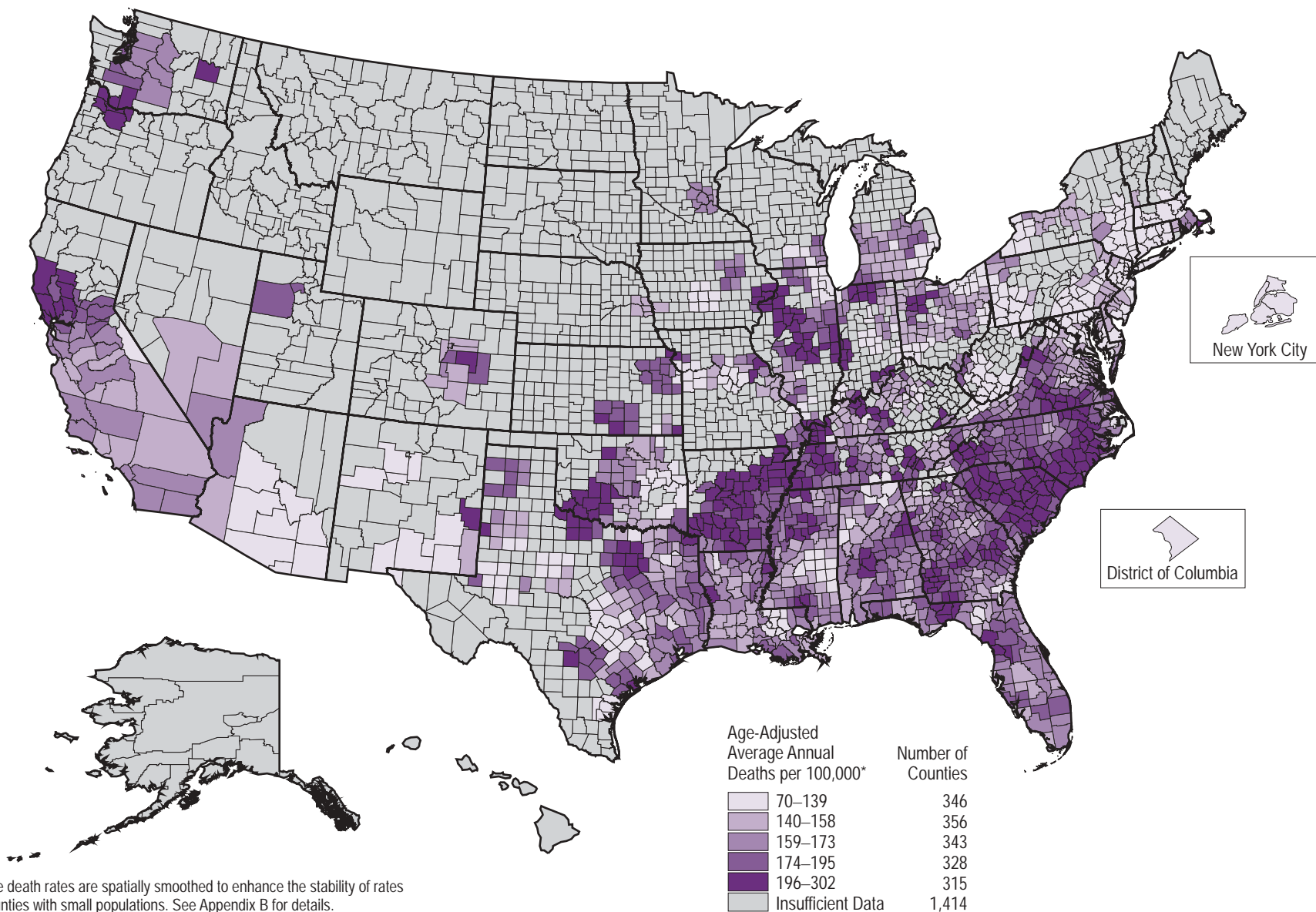
Blacks
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

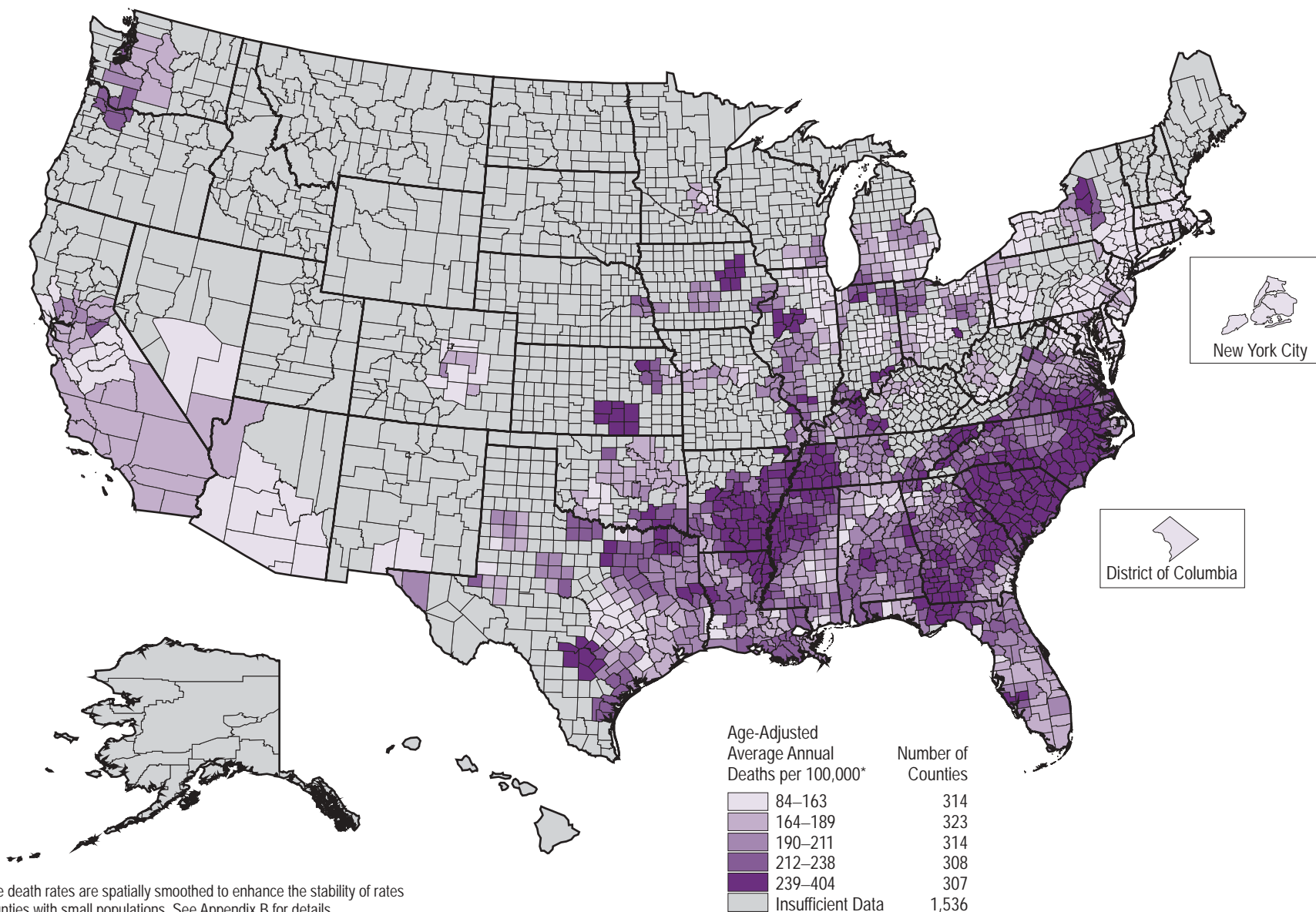
Smoothed County Stroke Death Rates 1991–1998

Black Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

Black Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Hispanics

Hispanics were the second largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.5% of all residents. During 1991–1998, the age-adjusted stroke death rate for Hispanics in this age group was 79/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Hispanics shows considerable geographic disparity across the 724 counties for which sufficient data existed to calculate rates. County death rates ranged from 20 to 239/100,000. An approximately fourfold difference existed between the midpoint of the highest quintile (173) and the midpoint of the lowest quintile (41). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Hispanics in all counties for which rates were calculated (Figure 3.13). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

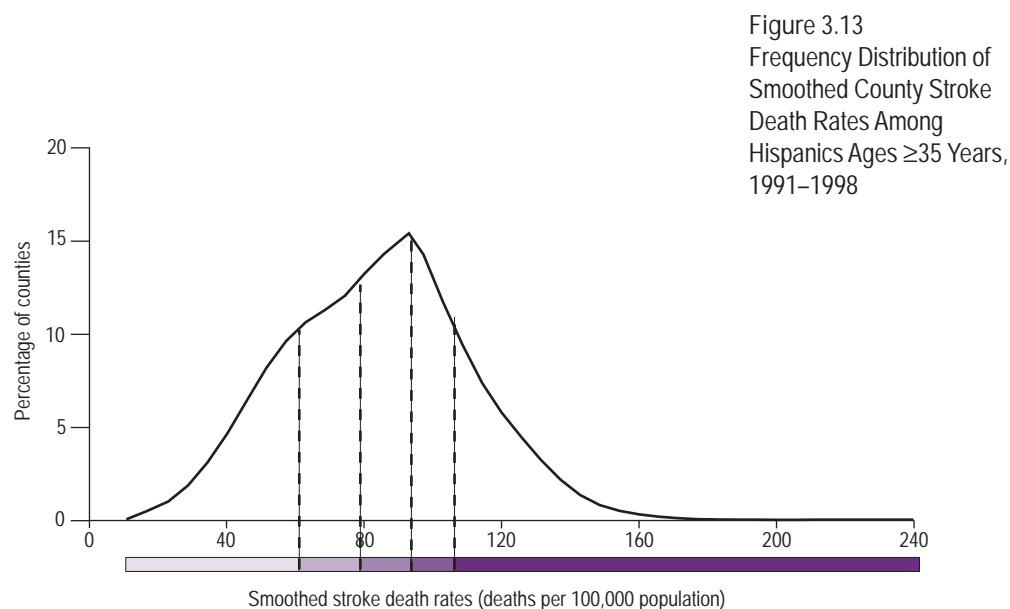
According to the map, the highest stroke death rates for Hispanics were reported primarily in an area that extends from central New Mexico southeast into northwestern and central Texas, with an additional concentration among counties in and around Corpus Christi. Smaller groupings of counties in the highest quintile were also observed in eastern Texas, south-central Colorado, and northern Washington. The majority of counties in the highest three quintiles are located in the southwestern and Pacific states. Although several counties with low rates were reported in northern California and Nevada, most of the lowest rates were observed in the Northeast, southern Florida, and Chicago, Illinois.

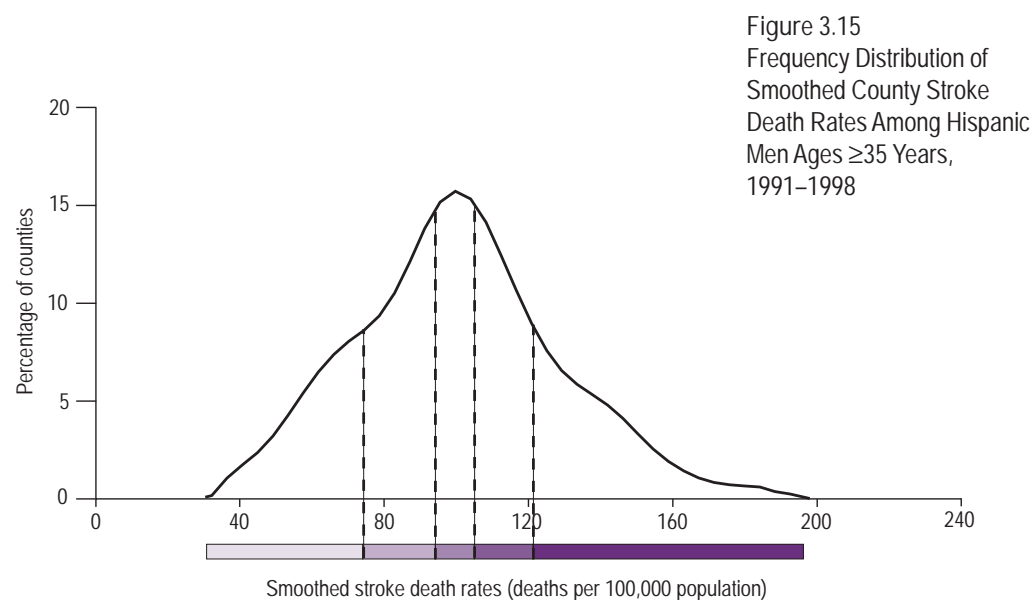
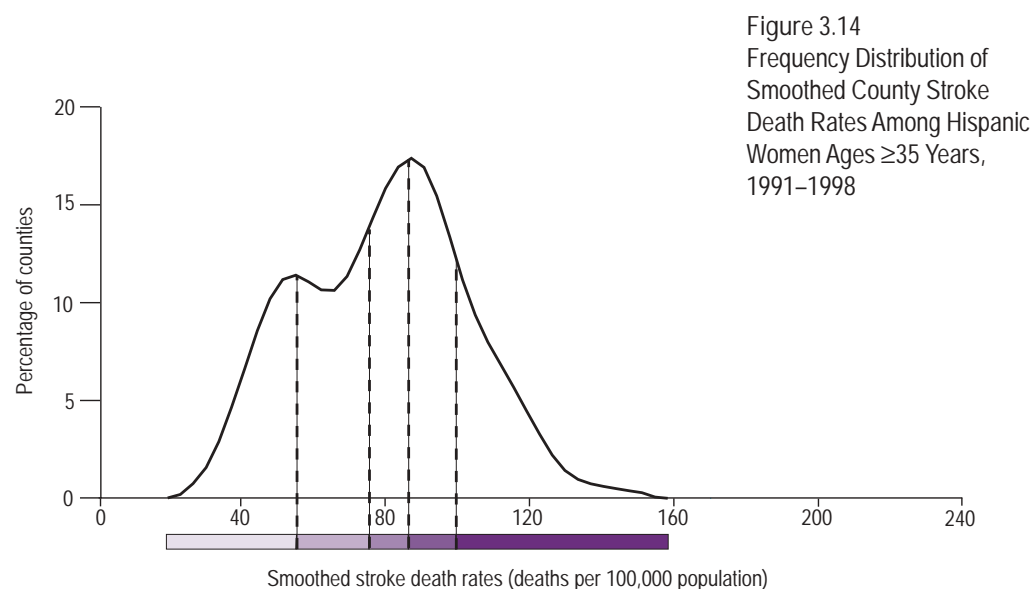
Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 72/100,000 for Hispanic women and 88/100,000 for Hispanic men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Hispanic women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Hispanic women, county death rates ranged from 22 to 156/100,000. The range for Hispanic men was 35 to 194/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (128 for women, 159 for men) and the midpoint of the lowest quintile (39 for women, 55 for men).

The frequency distributions show the range of smoothed stroke death rates for Hispanic women (Figure 3.14) and





men (Figure 3.15) in all counties for which rates were calculated.

The maps indicate that the largest concentrations of counties with the highest rates for both Hispanic women and men were reported in the southwestern states and California. New Mexico and California had larger concentrations of counties in the highest quintile for women compared with men, whereas Washington had a larger concentration of counties with high rates for men.

A Note on Methods

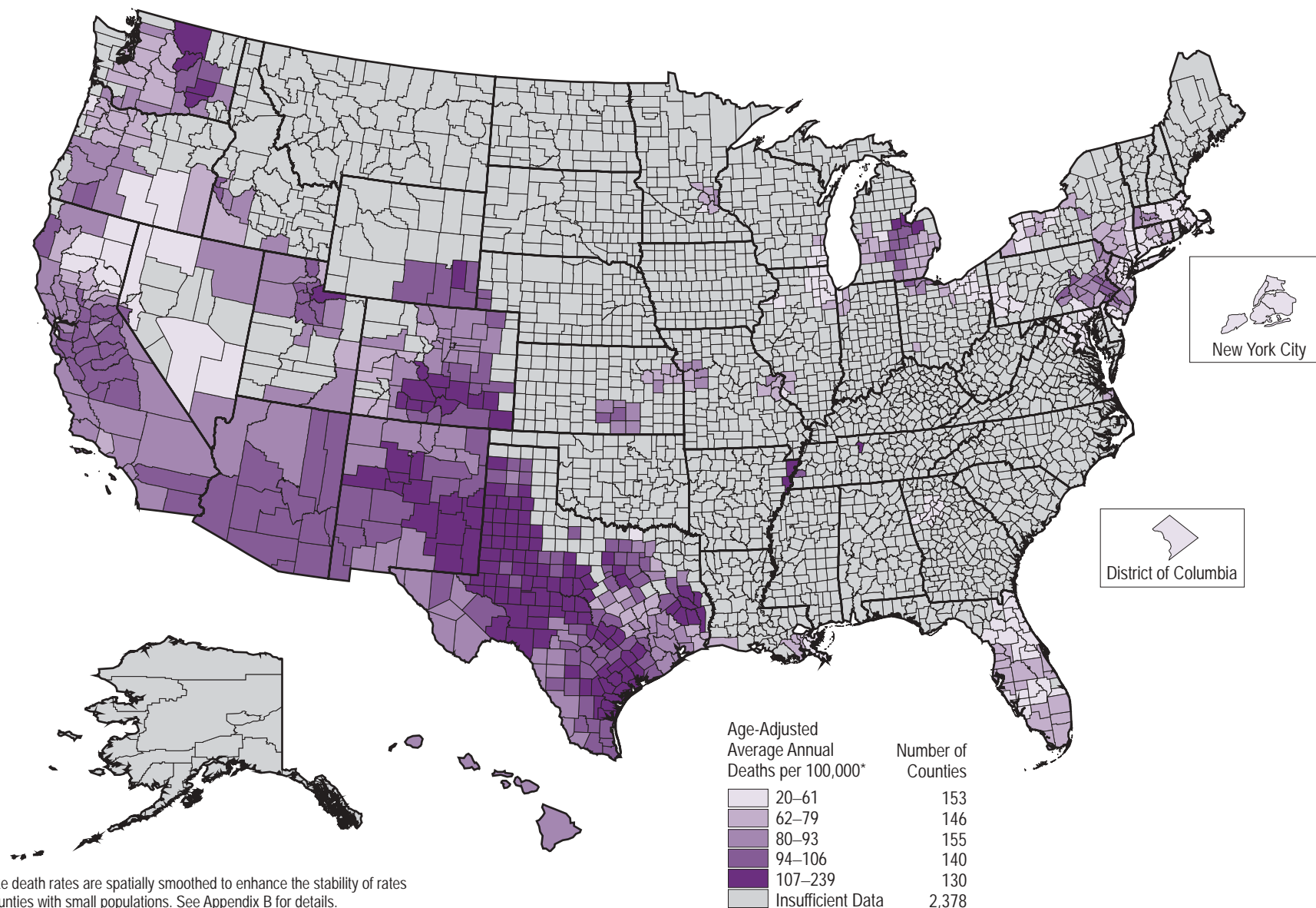
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that Hispanic decedents are sometimes misreported as non-Hispanic on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Hispanics. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of Hispanic origin on death certificates was a greater problem in certain parts of the country, then the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

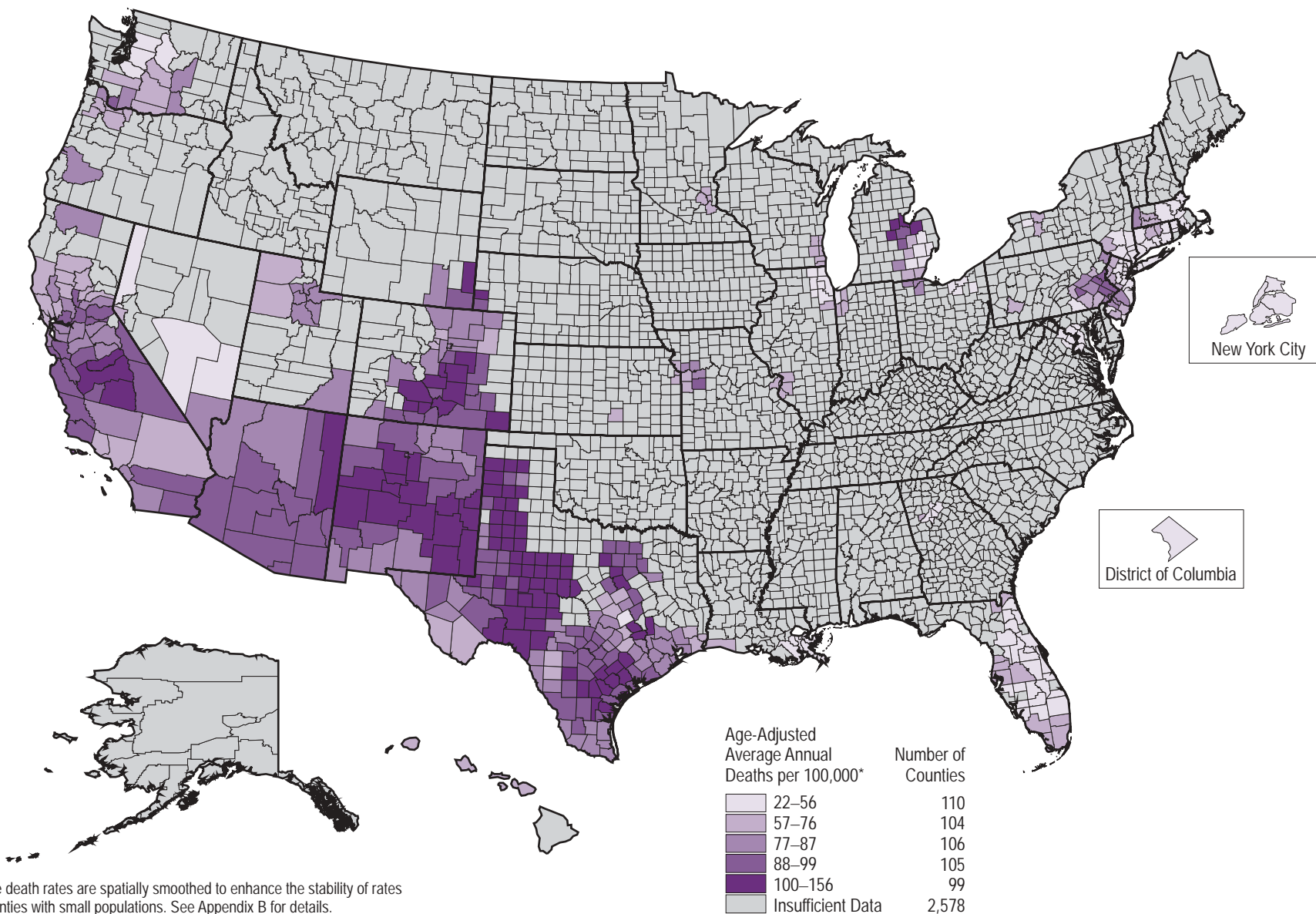
Hispanics
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

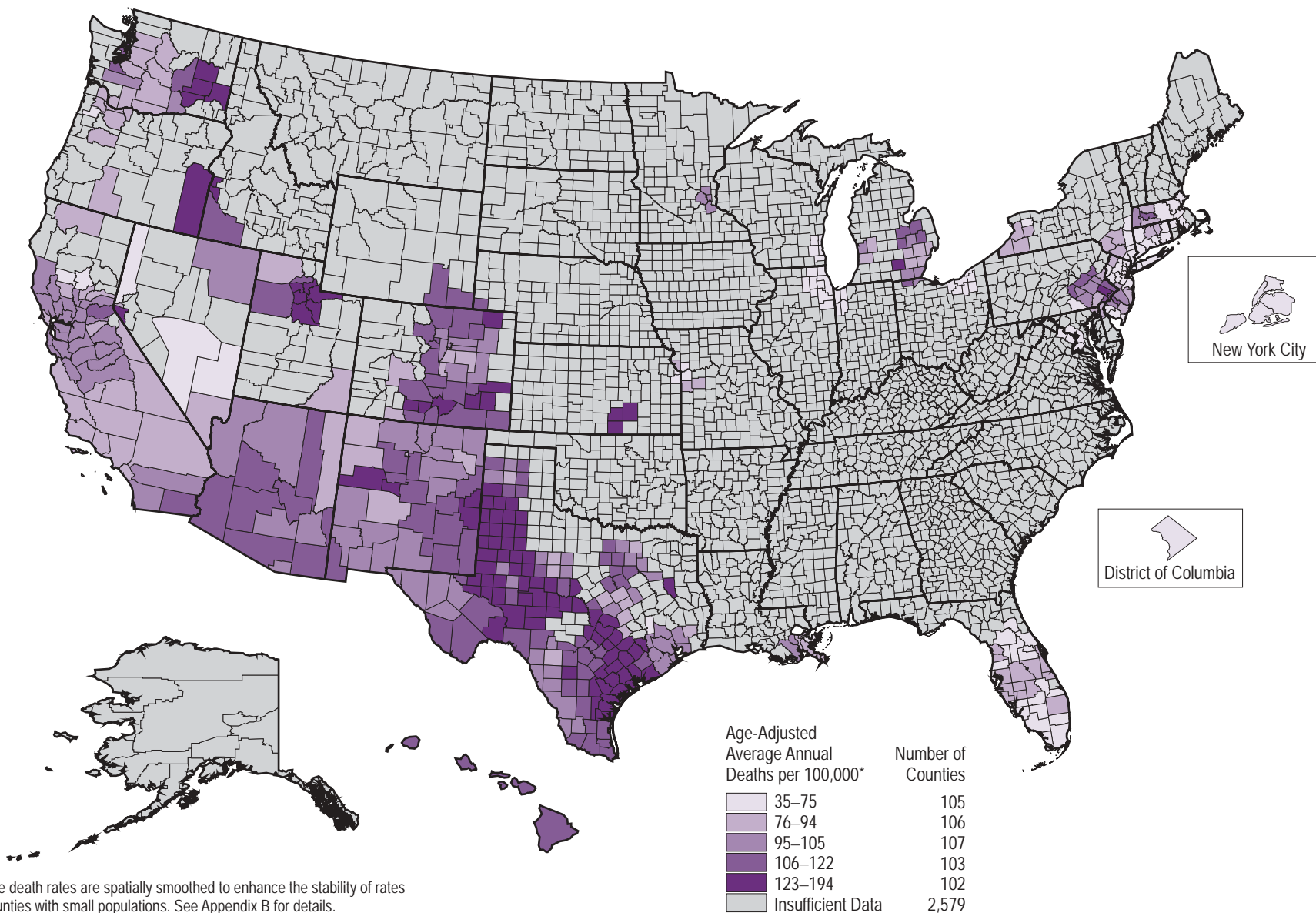
Smoothed County Stroke Death Rates 1991–1998

Hispanic Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

Hispanic Men Ages 35 Years and Older



Whites

Whites made up 77.1% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for whites in this age group was 117/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all whites shows considerable geographic disparity across the 3,095 counties for which sufficient data existed to calculate rates. County death rates ranged from 53 to 231/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (187) and the midpoint of the lowest quintile (83). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

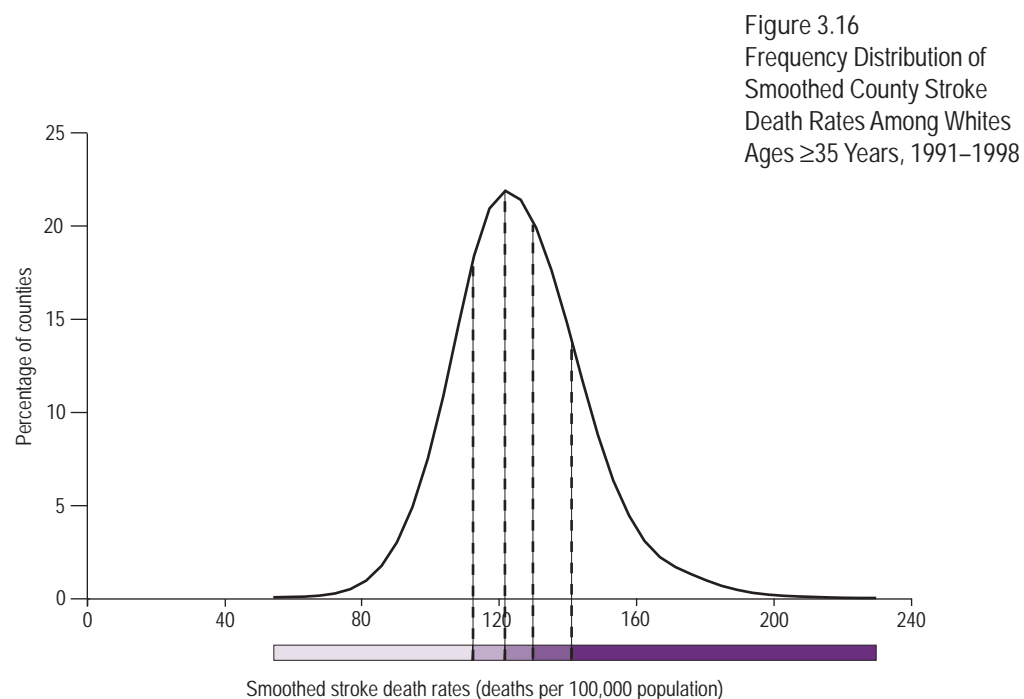
The frequency distribution shows the range of smoothed stroke rates for whites (Figure 3.16). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

According to the map, the highest stroke death rates for whites were reported in counties concentrated primarily in two areas of the Southeast. The first area encompasses the Piedmont and coastal counties of South Carolina and North Carolina, much of Virginia, and many of the southern, rural Georgia counties of the Cotton Belt. The second area is the Mississippi Delta, including nearly all of Arkansas, northwestern counties of Mississippi, much of Tennessee, and parts of Kentucky. Other groupings of counties in the highest quintile were reported in northern Michigan, northwestern Oregon, and parts of central Texas and around San Francisco. Counties in the lowest quintile were reported primarily in the Northeast, southern Florida, and parts of the Great Plains and Southwest. Alaska and Hawaii also had counties in the lower quintiles.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 113/100,000 for white women and 121/100,000 for white men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for white women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For white women, county death rates ranged from 51 to 229/100,000. The range for white men was 42 to 229/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 189 for men) and the midpoint of the lowest quintile (79 for women, 79 for men).



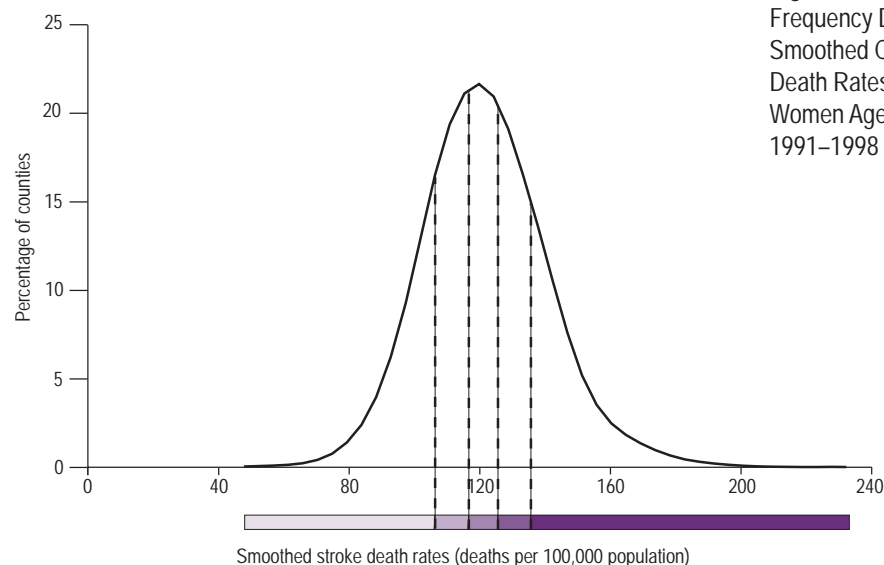


Figure 3.17
Frequency Distribution of
Smoothed County Stroke
Death Rates Among White
Women Ages ≥35 Years,
1991–1998

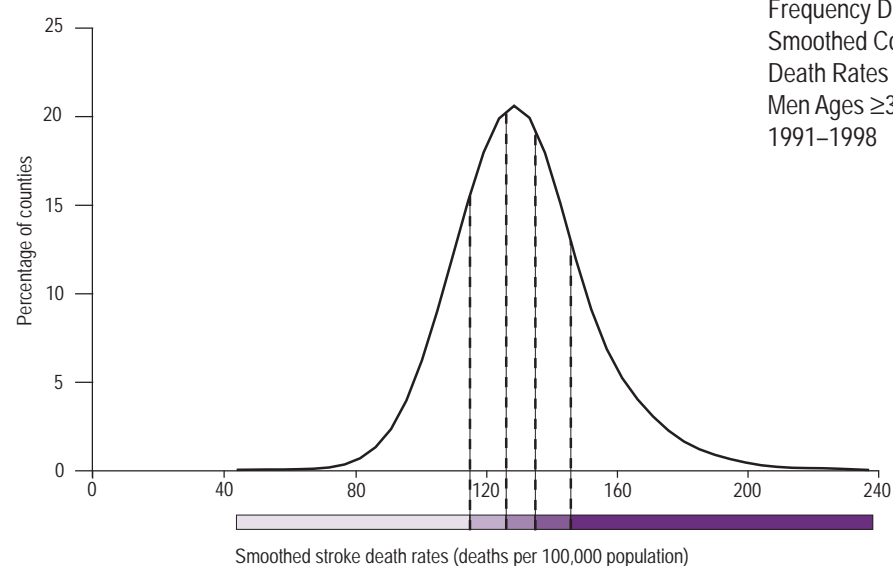


Figure 3.18
Frequency Distribution of
Smoothed County Stroke
Death Rates Among White
Men Ages ≥35 Years,
1991–1998

The frequency distributions show the range of smoothed stroke death rates for white women (Figure 3.17) and men (Figure 3.18) in all counties for which rates were calculated.

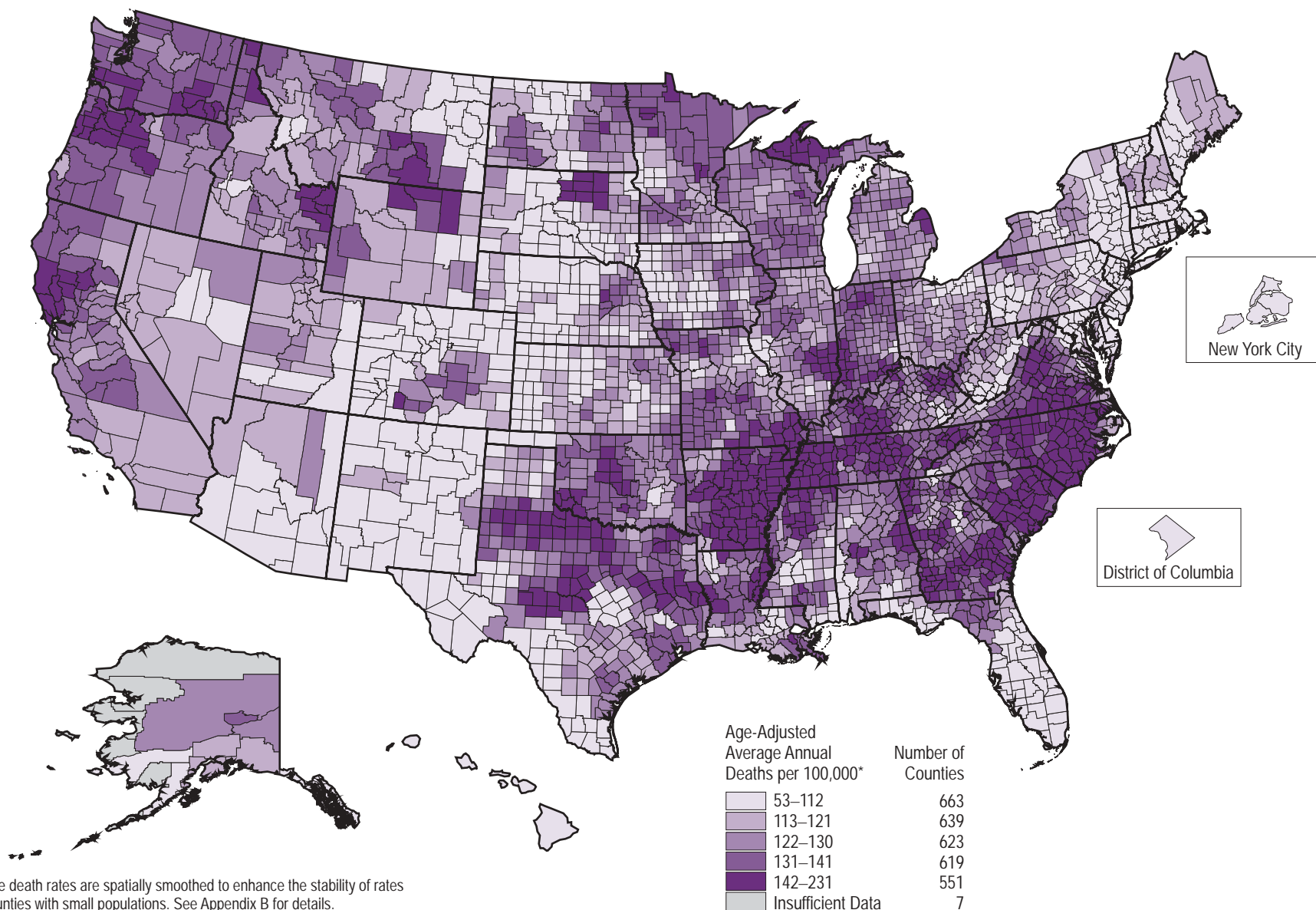
The maps indicate that for both white women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for white women and white men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For white women, many of the counties in the western states were in the highest quintile. For white men, western counties in the highest quintiles were concentrated primarily in the Pacific Northwest and northern California; concentrations of counties with high rates also were observed in North Dakota and South Dakota.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates 1991–1998

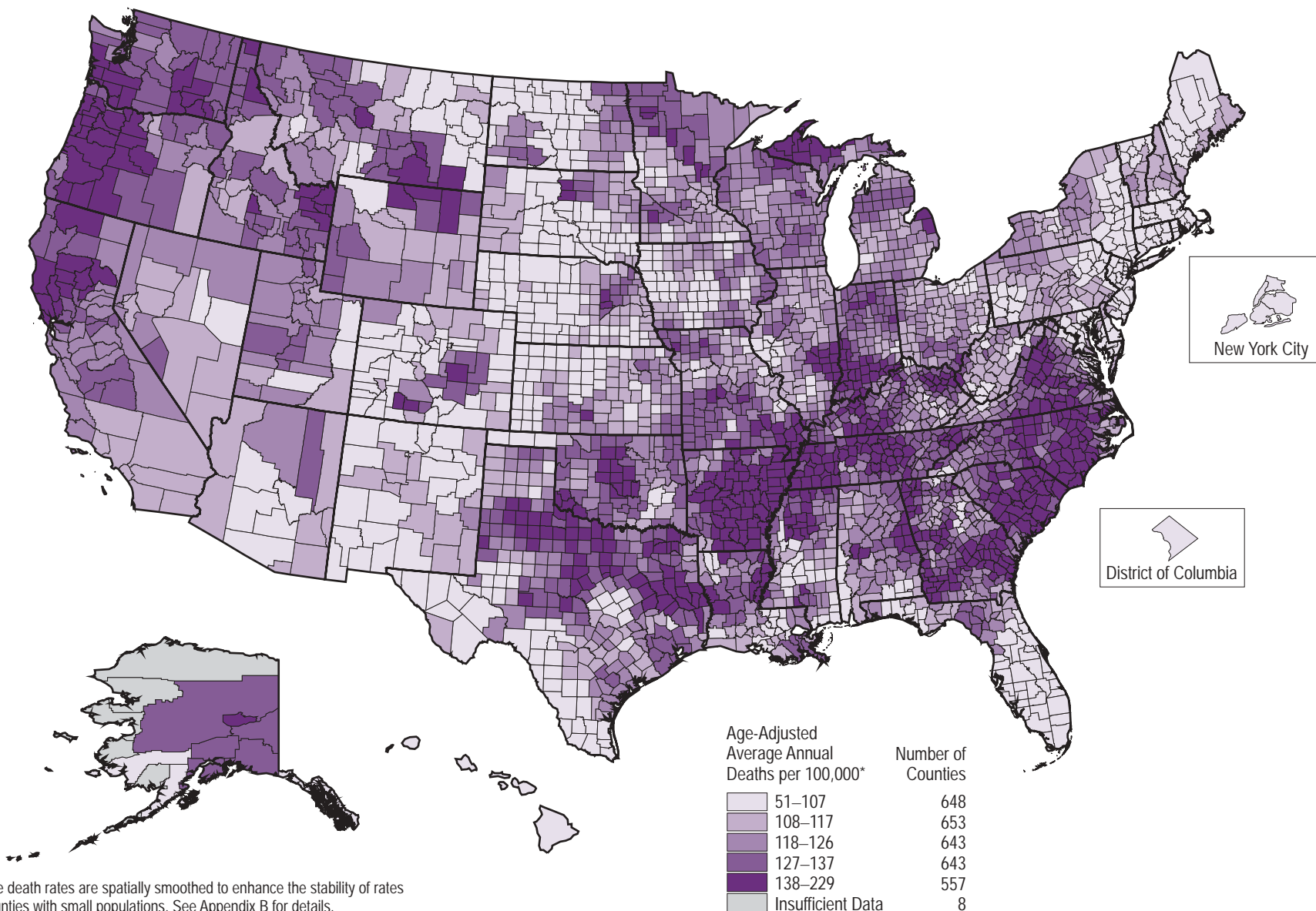
Whites
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

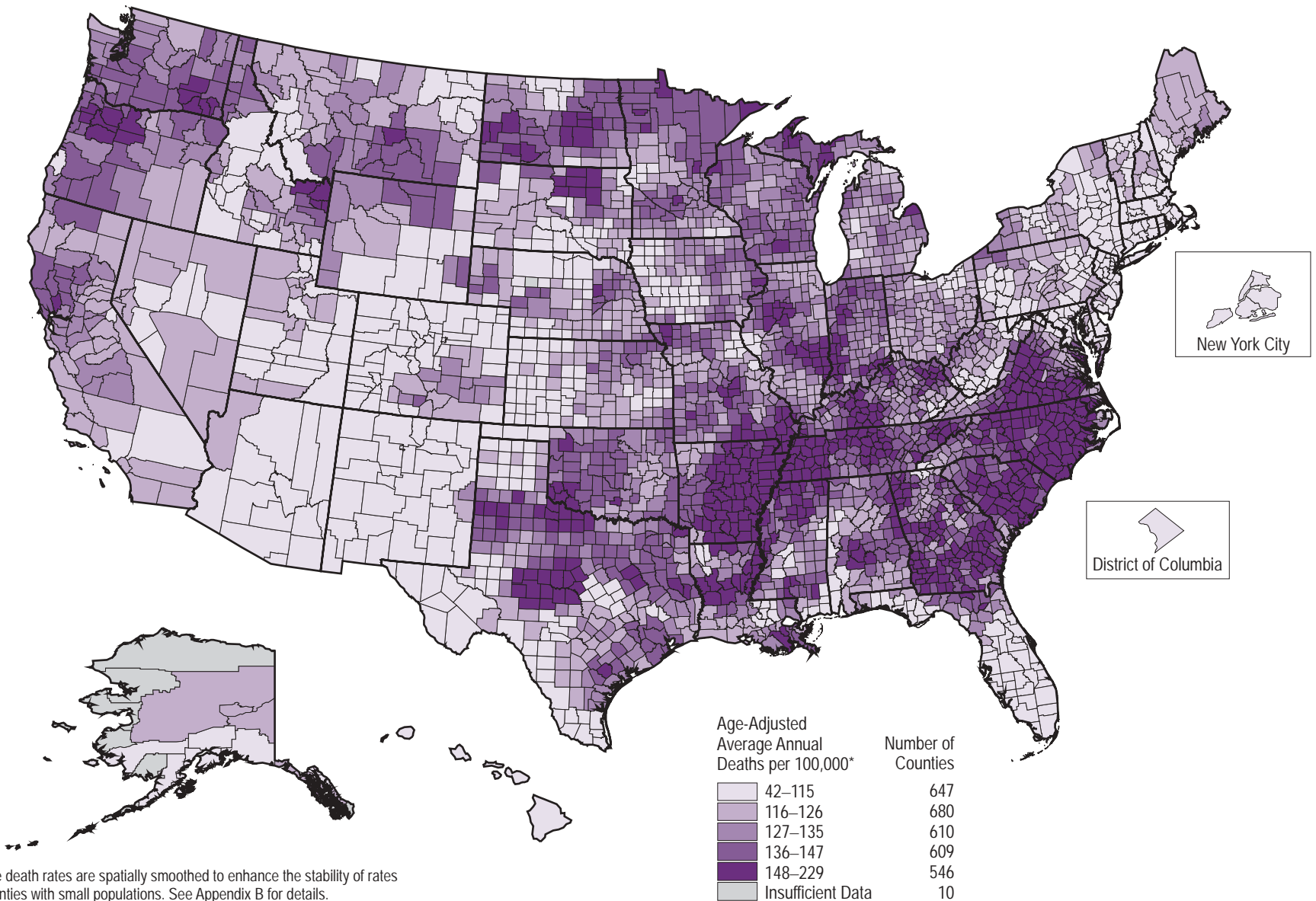
Smoothed County Stroke Death Rates 1991–1998

White Women
Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

White Men
Ages 35 Years and Older



A Detroit woman listens to South African political
activist Nelson Mandela speak in June 1990
shortly after his release from prison.



© Jim West

3 National Maps of Stroke Mortality by Race, Ethnicity, and Gender

In this section, national geographic disparities in stroke death rates are presented for the total U.S. population and for the five largest racial and ethnic groups in the United States—American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. A map depicting rates for the total population of each racial and ethnic group is followed by separate maps for women and men in each group.

Each national map presents spatially smoothed, age-adjusted stroke death rates for counties across the United States. Hawaii, New York City, and the District of Columbia are displayed using a larger scale than the rest of the nation to enhance visualization of these areas. Alaska is shown using a smaller scale because of the large land area it occupies.

For American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and Hispanics, stroke death rates

were not calculated for a majority of counties nationwide because of small population sizes and infrequent stroke deaths in these counties. If a county and its neighboring counties reported fewer than 20 stroke deaths for a specific racial or ethnic group during 1991–1998, then a rate was not calculated for that county (see Appendix B for more details).

For part of the study period, Oklahoma and New Hampshire did not collect data on Hispanic origin on death certificates. Consequently, we were unable to report stroke death rates for Hispanics in those states. During 1991–1993 in New York City, Hispanic origin was recorded as “unknown” on approximately 18% of stroke death certificates for people ages 35 and older. Therefore, the stroke death rates for Hispanics in New York City may be underestimated.

Total Population

The age-adjusted stroke death rate for U.S. residents ages 35 and older was 121/100,000 during 1991–1998. Stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The national map of age-adjusted, spatially smoothed stroke death rates for the total U.S. population shows considerable geographic disparity across the 3,100 counties for which data were available. County death rates ranged from 61 to 241/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (194) and the midpoint of the lowest quintile (87). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for the total population (Figure 3.1). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

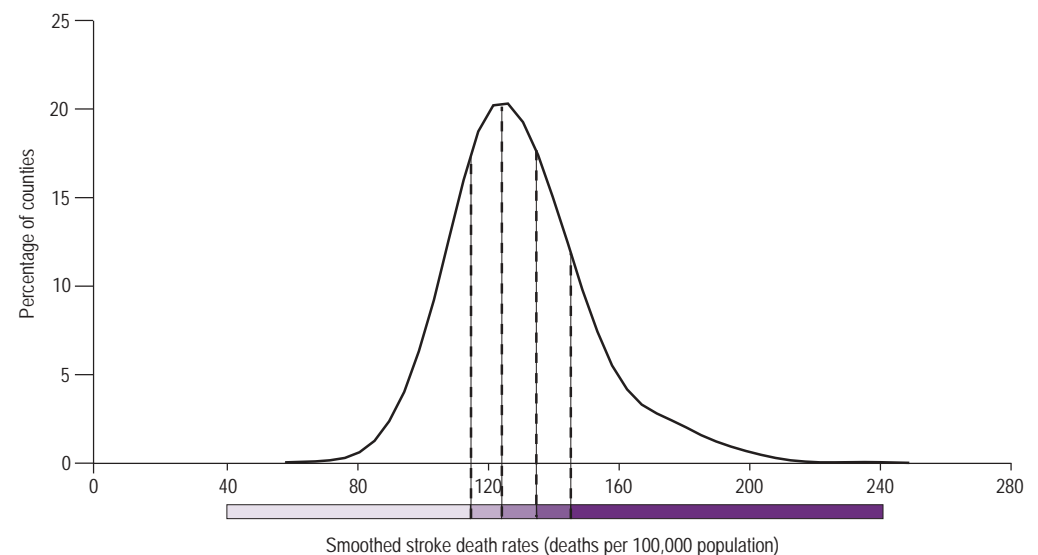
The map for the total population indicates that a majority of the counties in the southeastern states (except Florida) were in the top 40% of stroke death rates. The overall pattern shows that nearly all of the counties in the highest quintile were reported in two areas of the Southeast. The first area covers vast expanses of southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia), as well as part of Alabama. The second area encompasses Mississippi Delta counties in Tennessee, Arkansas, Mississippi, Louisiana, and the southeastern “bootheel” area of Missouri. A separate pocket of counties with high rates was observed in the Pacific Northwest, namely Washington, Oregon, and northern California. Counties in the lowest quintile were reported primarily in the Southwest, the Great Plains, the Northeast, and southern Florida.

All Women and All Men

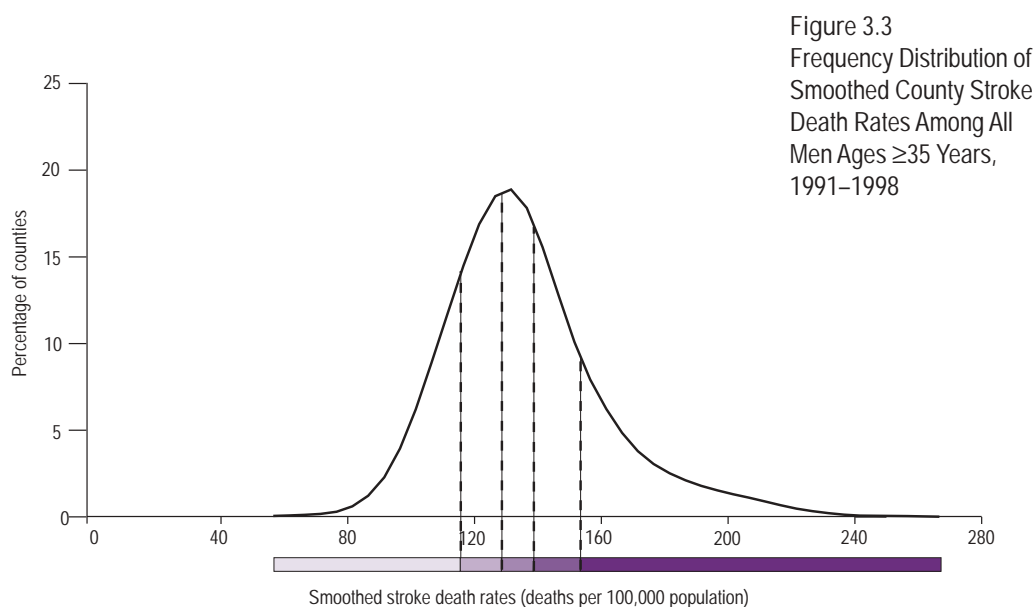
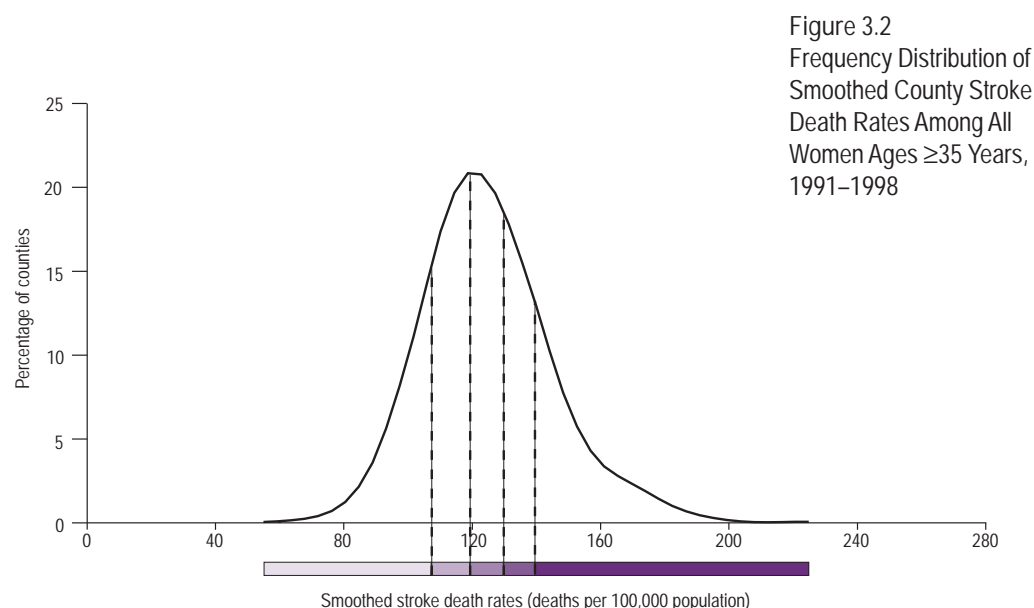
During 1991–1998, the age-adjusted death rate for stroke was 117/100,000 for women and 126/100,000 for men ages 35 and older. For both women and men, stroke is the third leading cause of death in the United States, preceded by heart disease and cancer.

The maps of age-adjusted, spatially smoothed stroke death rates for women and men show considerable geographic disparity. For women, county death rates ranged from 58 to 226/100,000. The range for men was 60 to 258/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 206 for men) and the midpoint of the lowest quintile (84 for women, 88 for men).

Figure 3.1
Frequency Distribution of
Smoothed County Stroke
Death Rates Among All
People Ages ≥35 Years,
1991–1998



Stroke Mortality: Total Population



The frequency distributions show the range of smoothed stroke death rates for women (Figure 3.2) and for men (Figure 3.3).

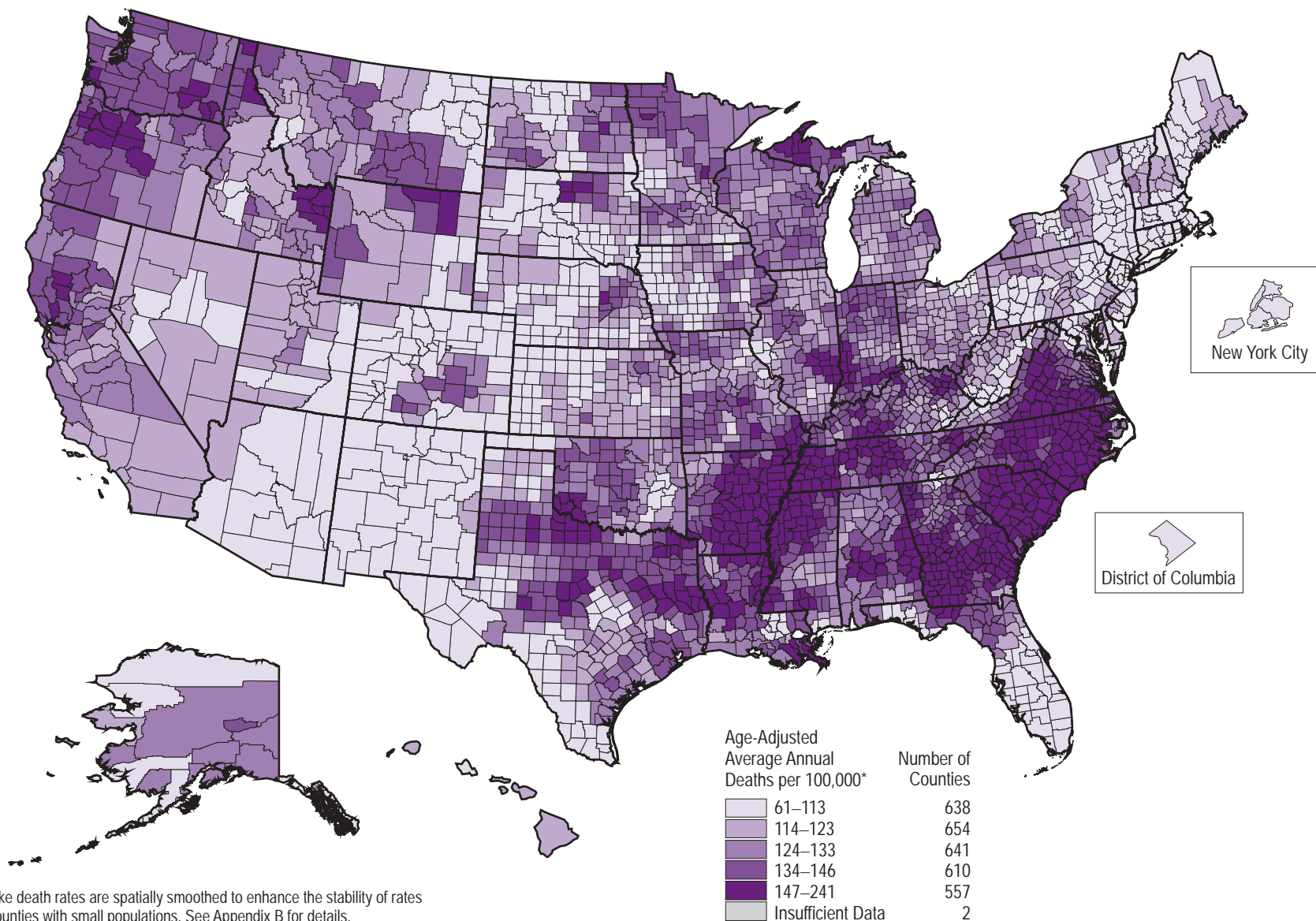
The maps indicate that for both women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For women, a pocket of counties with high rates extended from the western portion of Montana westward and southward through much of California. For men, a concentration of counties with high rates was observed in North Dakota, South Dakota, and other sections of the Midwest.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates 1991–1998

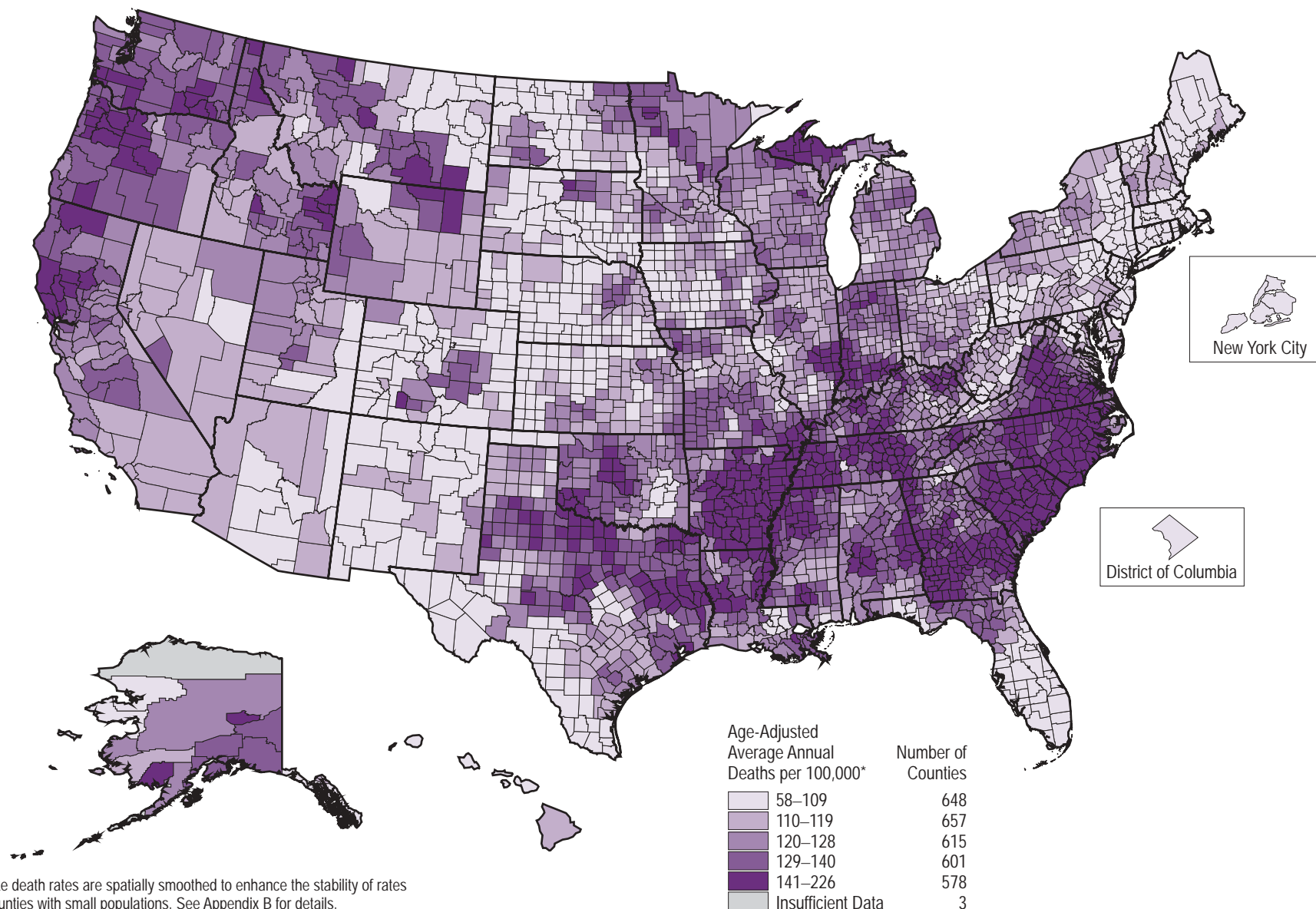
Total Population
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

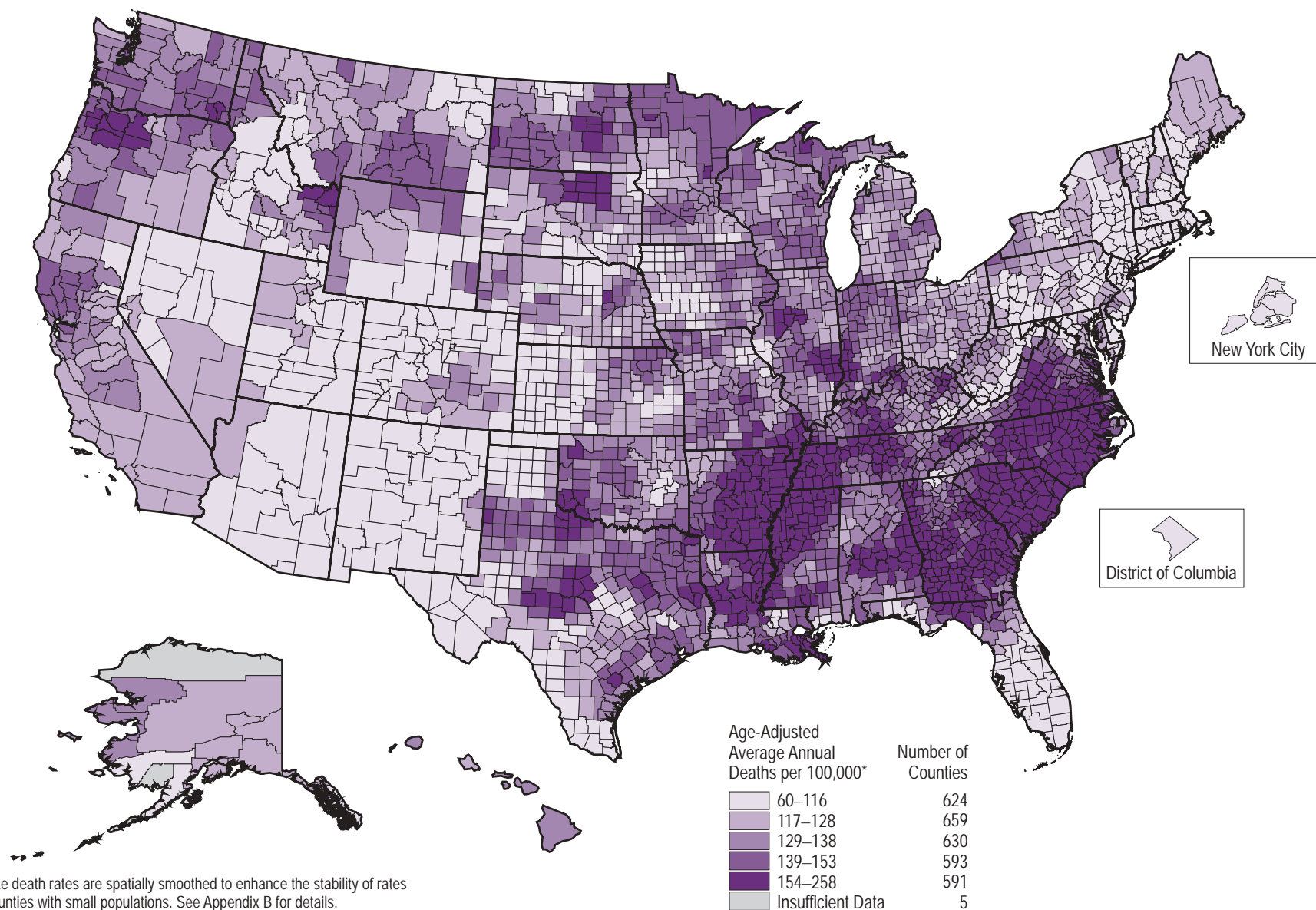
All Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

All Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

American Indians and Alaska Natives

American Indians and Alaska Natives made up 1.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for American Indians and Alaska Natives in this age group was 79/100,000. The American Indian and Alaska Native population in the United States is composed of many politically and culturally distinct Tribal Nations residing both in rural areas (including reservations with limited political sovereignty) and urban areas.

The national map of age-adjusted, spatially smoothed stroke death rates for all American Indians and Alaska Natives shows considerable geographic disparity across the 303 counties for which sufficient data existed to calculate rates. County death rates ranged from 29 to 272/100,000. A nearly fivefold difference existed between the midpoint of the highest quintile (222) and the midpoint of the lowest quintile (46). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for American Indians and Alaska Natives in all counties for which rates were calculated (Figure 3.4). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

The map suggests somewhat of a north-south gradient in stroke mortality among American Indians and Alaska Natives. Counties with high rates were reported primarily in the northern states of Alaska, Washington, Idaho, Montana, Wyoming, South Dakota, Wisconsin, and Minnesota. Counties with low rates were reported primarily in central Oklahoma (predominantly among members of the Cherokee Nation), southern California, Arizona, and New Mexico. Exceptions to the north-south gradient were high rates in counties along the North Carolina–South

Carolina border (where the Lumbee Indians reside), along the southern tip of Louisiana, and in Nevada.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 77/100,000 for American Indian and Alaska Native women and 80/100,000 for American Indian and Alaska Native men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for American Indian and Alaska Native women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For American Indian and Alaska Native women, county death rates ranged from 35 to 291/100,000. The range for American Indian and Alaska Native men was 33 to 291/100,000. For both women and men, a fivefold difference existed between the midpoint of the highest quintile (229 for women, 237 for men) and the midpoint of the lowest quintile (46 for women, 49 for men).

The frequency distributions show the range of smoothed stroke death rates for American Indian and Alaska Native

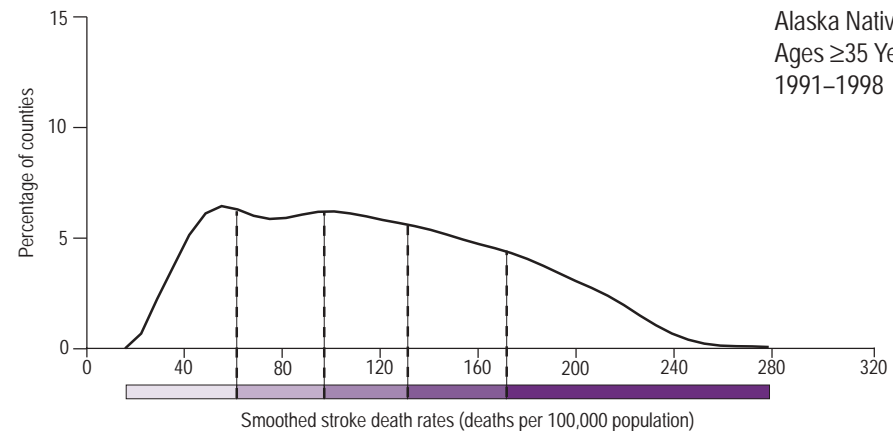


Figure 3.4
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indians and
Alaska Natives
Ages ≥35 Years,
1991–1998

Stroke Mortality: American Indians and Alaska Natives

Figure 3.5
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indian and
Alaska Native Women
Ages ≥ 35 Years,
1991–1998

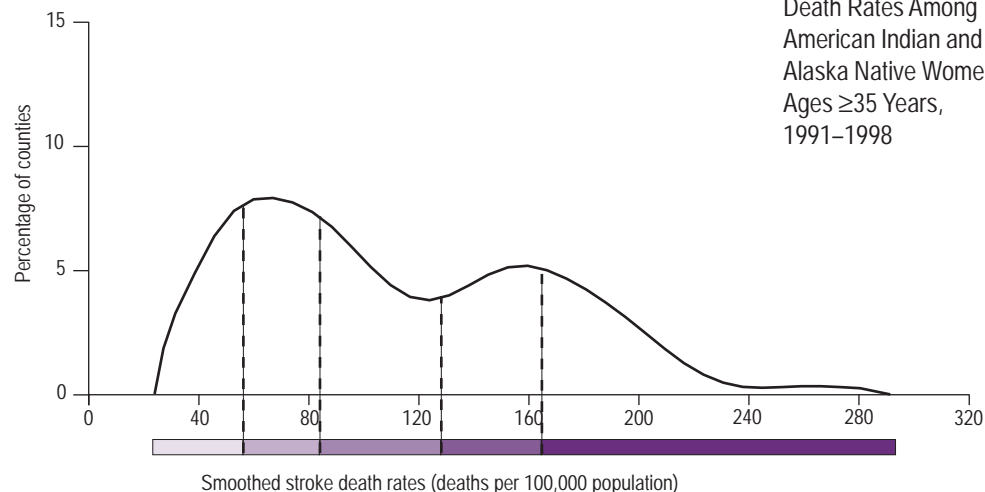
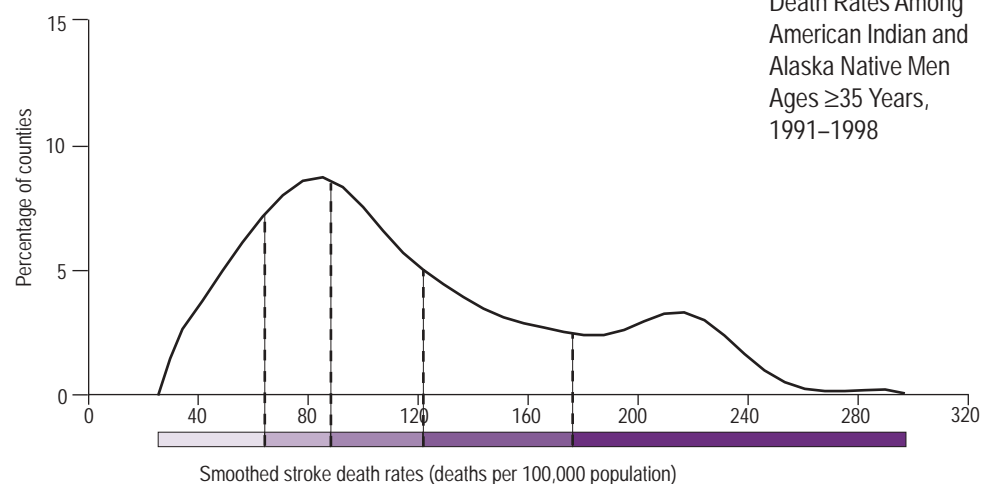


Figure 3.6
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
American Indian and
Alaska Native Men
Ages ≥ 35 Years,
1991–1998



women (Figure 3.5) and men (Figure 3.6) in all counties for which rates were calculated.

The maps for women and men indicate slightly different geographic patterns than the pattern for the total population. This difference can be largely attributed to the small number of counties with sufficient data to calculate rates for women and men separately. The patterns for American Indian and Alaska Native women and men are similar, with groups of counties with high rates in Oregon, northern California, and Arizona.

A Note on Methods

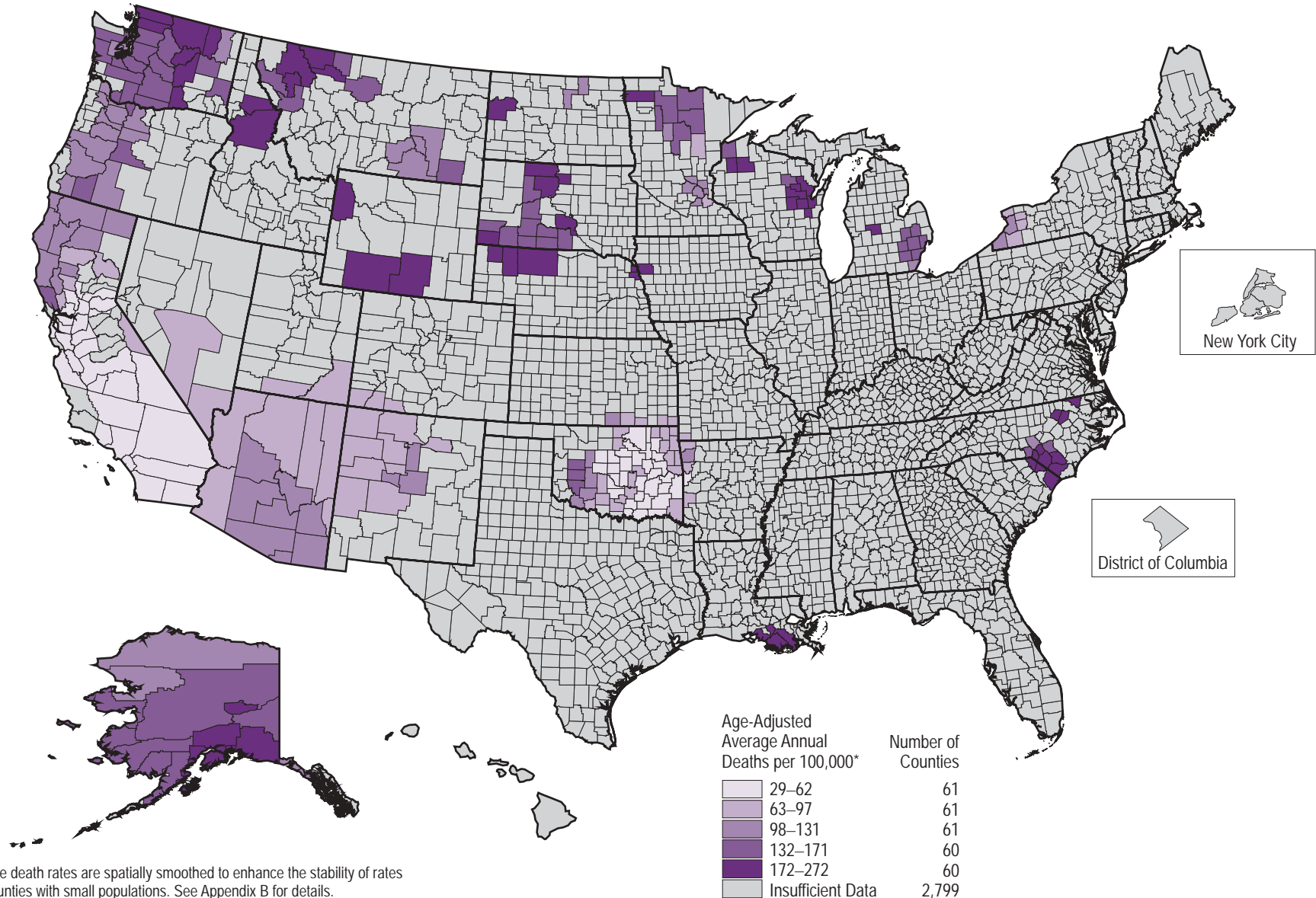
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate the death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for American Indians and Alaska Natives. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

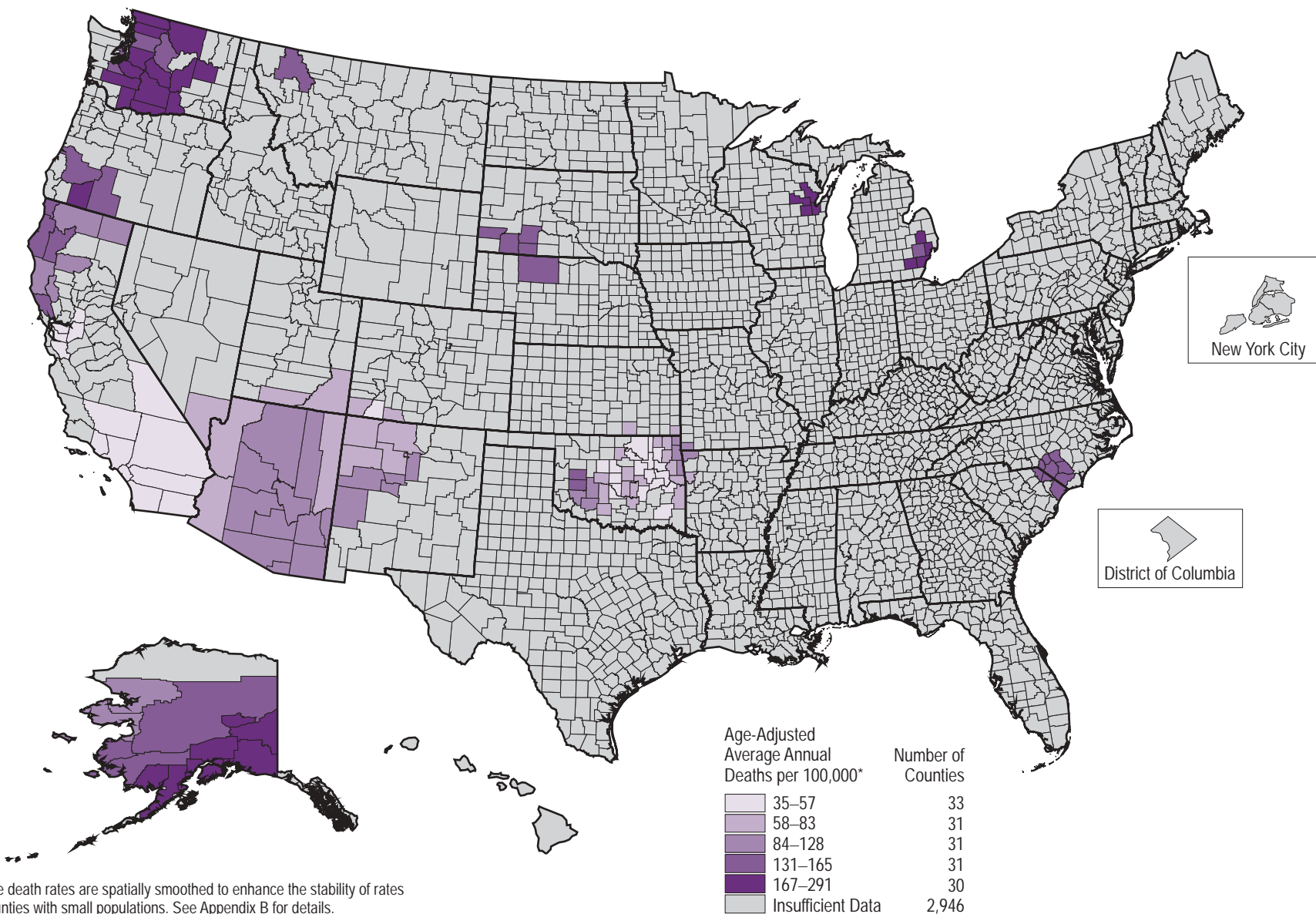
American Indians and Alaska Natives Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

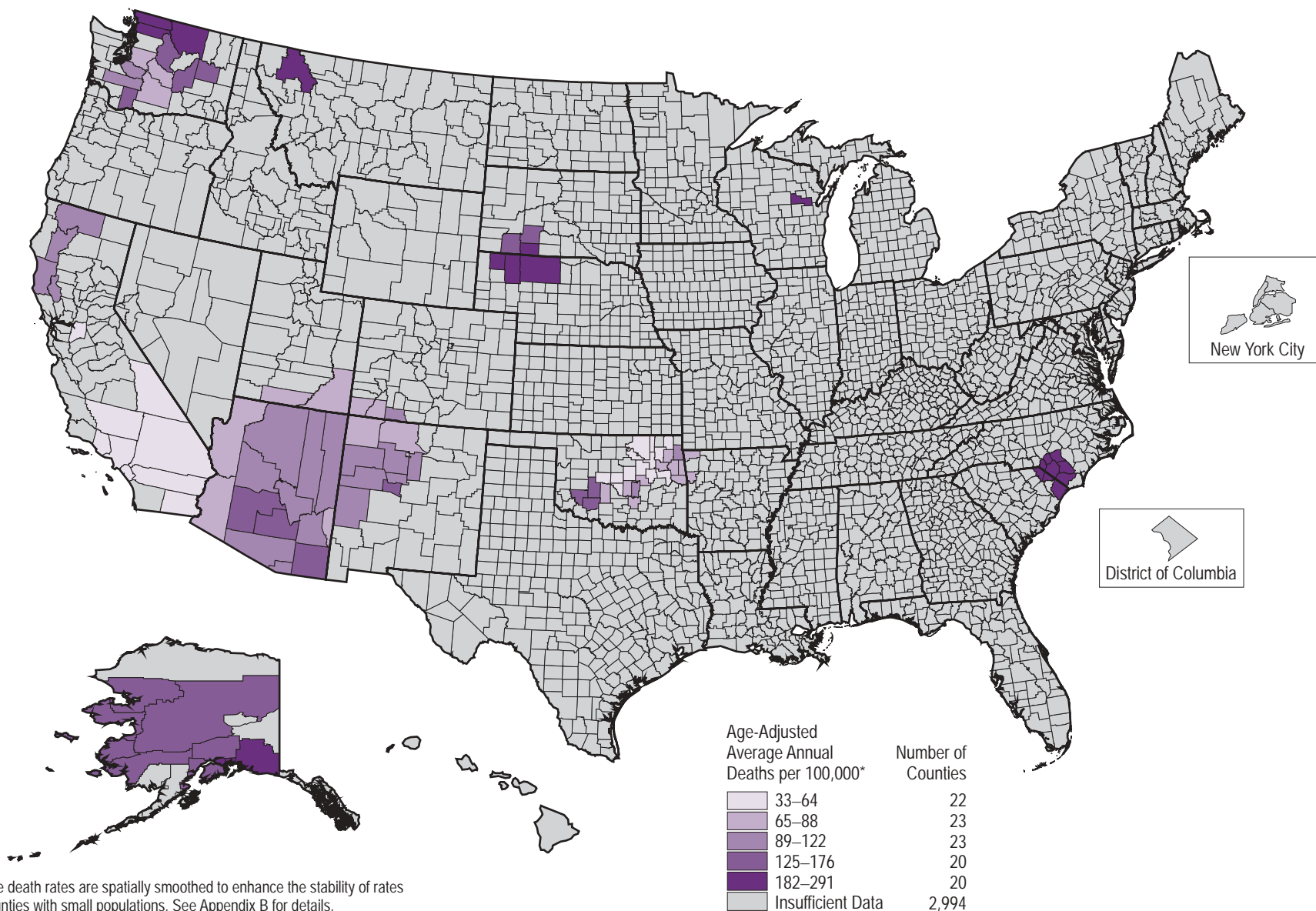
Smoothed County Stroke Death Rates 1991–1998

American Indian and Alaska Native Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

American Indian and Alaska Native Men Ages 35 Years and Older



Asians and Pacific Islanders

Asians and Pacific Islanders made up 4.5% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for Asians and Pacific Islanders in this age group was 105/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Asians and Pacific Islanders shows considerable geographic disparity across the 364 counties for which sufficient data existed to calculate rates. County death rates ranged from 43 to 184/100,000. A nearly threefold difference existed between the midpoint of the highest quintile (156) and the midpoint of the lowest quintile (56). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Asians and Pacific Islanders in all counties for which rates were calculated (Figure 3.7). The vertical dotted lines and graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

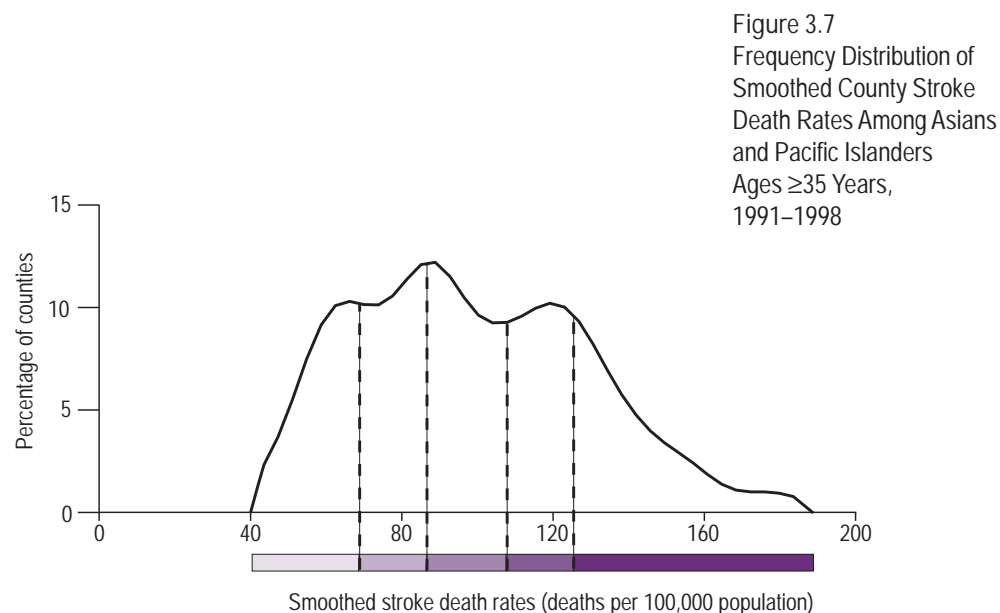
The map indicates a west-east gradient of stroke mortality among Asians and Pacific Islanders. Counties with the highest rates were reported in sections of Washington, Oregon, California, Nevada, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Memphis, Tennessee. Counties with the lowest rates were reported in the metropolitan areas of New York City, Philadelphia, Chicago, Miami and other parts of southern and middle Florida, and New Jersey.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 96/100,000 for Asian and Pacific Islander women and 118/100,000 for Asian and Pacific Islander men ages 35 and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Asian and Pacific Islander women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Asian and Pacific Islander women, county death rates ranged from 33 to 237/100,000. The range for Asian and Pacific Islander men was 40 to 209/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (178 for women, 176 for men) and the midpoint of the lowest quintile (54 for women, 61 for men).

The frequency distributions show the range of smoothed stroke death rates for Asian and Pacific Islander women



Stroke Mortality: Asians and Pacific Islanders

Figure 3.8
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Asian
and Pacific Islander
Women Ages ≥ 35 Years,
1991–1998

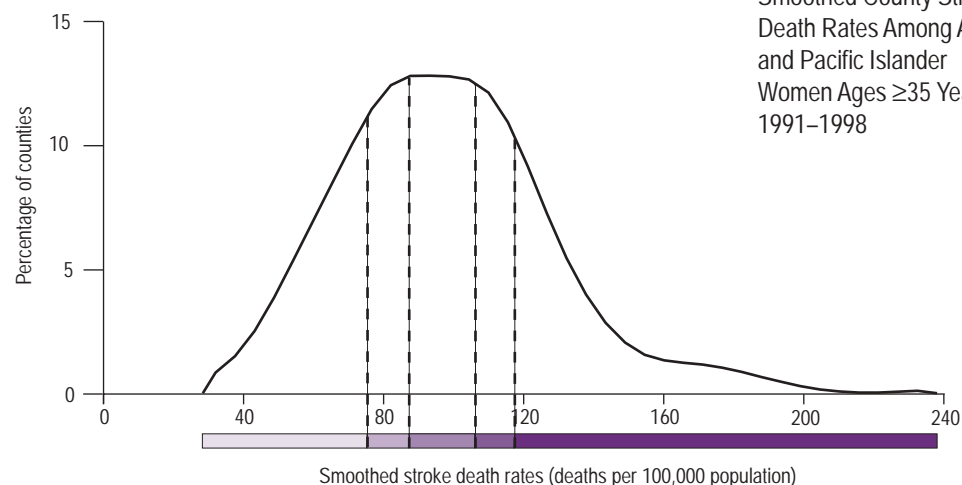
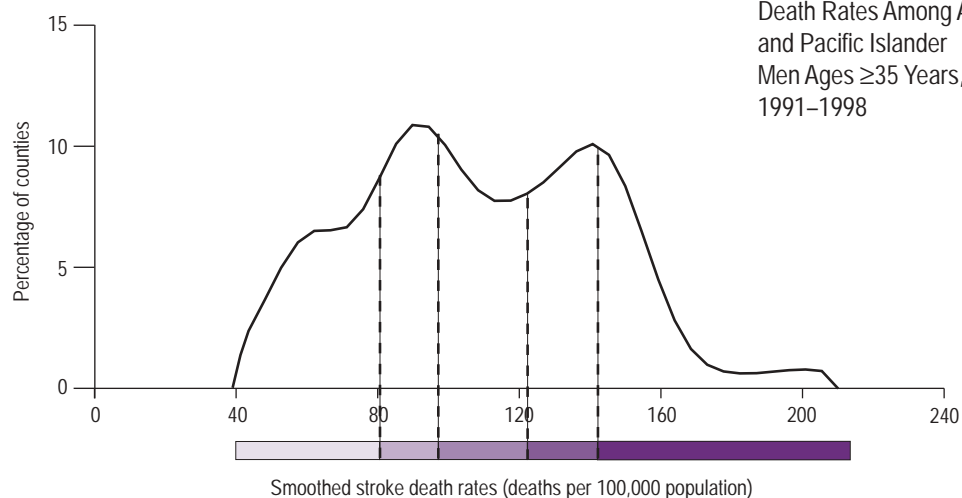


Figure 3.9
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Asian
and Pacific Islander
Men Ages ≥ 35 Years,
1991–1998



(Figure 3.8) and men (Figure 3.9) in all counties for which rates were calculated.

The maps indicate a west-east gradient of stroke mortality for both Asian and Pacific Islander women and men. Counties with the highest rates were reported primarily in sections of Washington, Oregon, California, Nevada, Utah, and Arizona, with pockets of counties with high rates in the metropolitan areas of Minneapolis/St. Paul, Minnesota, and Dallas, Texas.

A Note on Methods

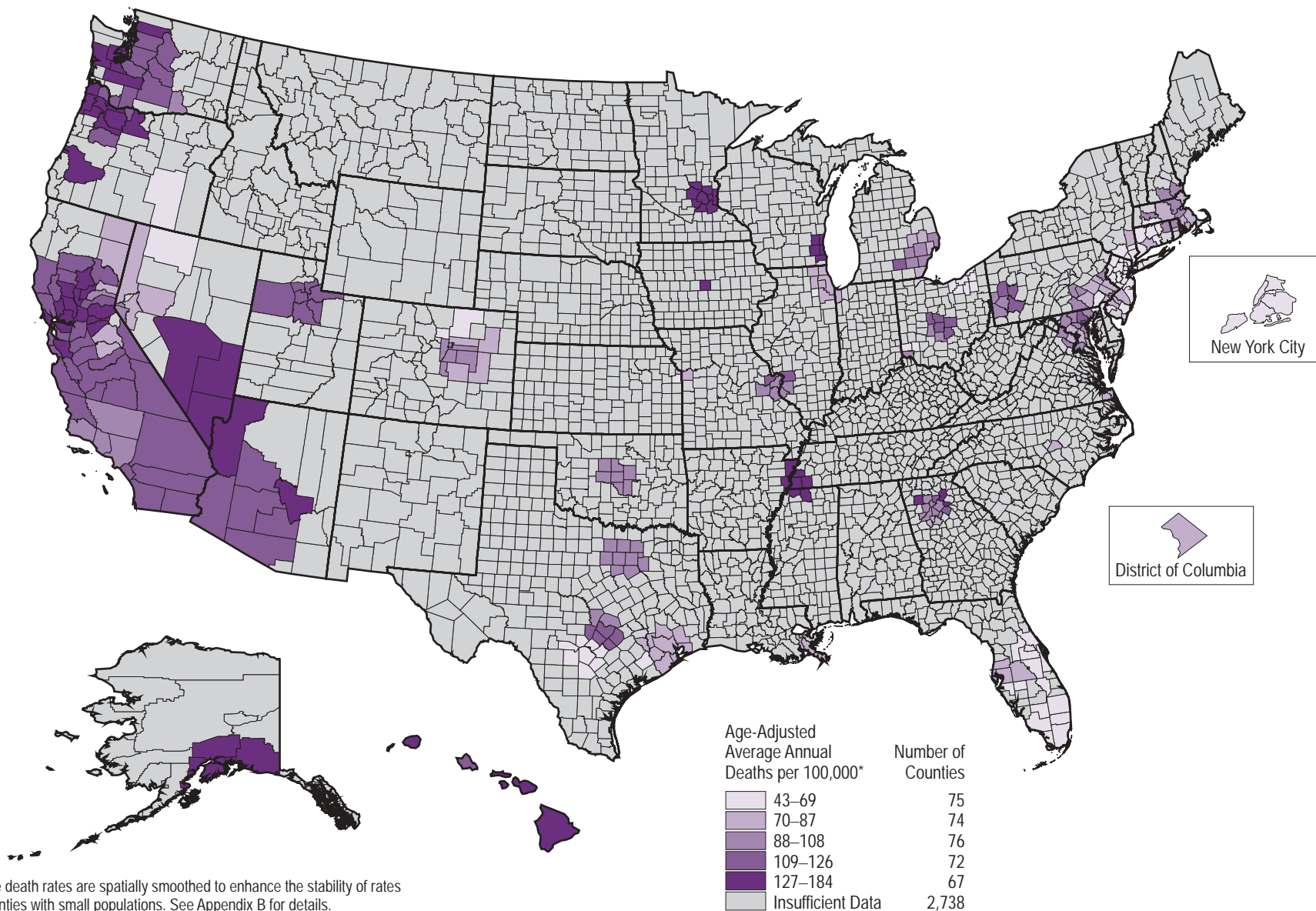
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that decedents of certain racial and ethnic minorities are sometimes misreported as “white” on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Asians and Pacific Islanders. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of race and ethnicity on death certificates was a greater problem in certain parts of the country than others, the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

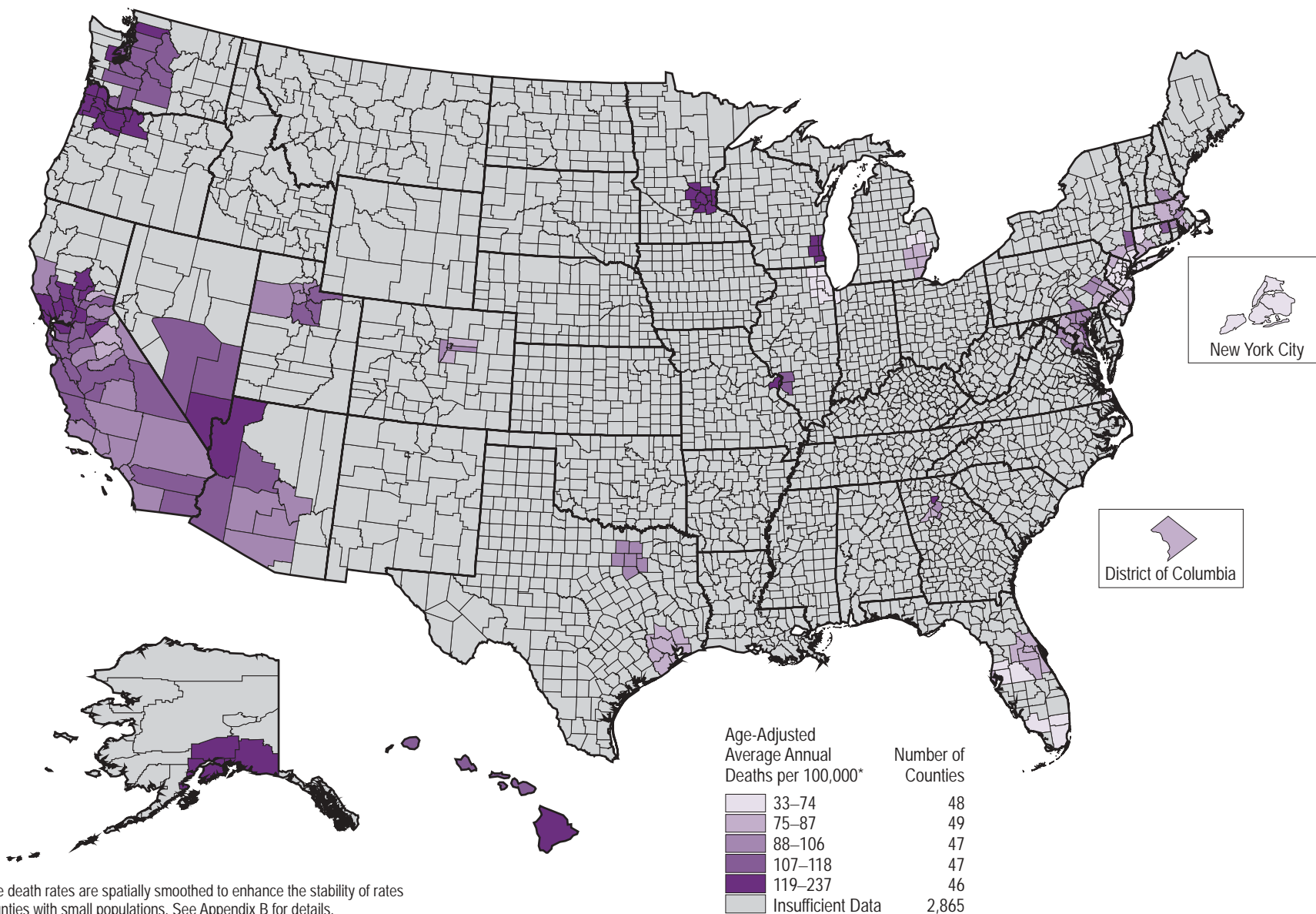
Asians and Pacific Islanders Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

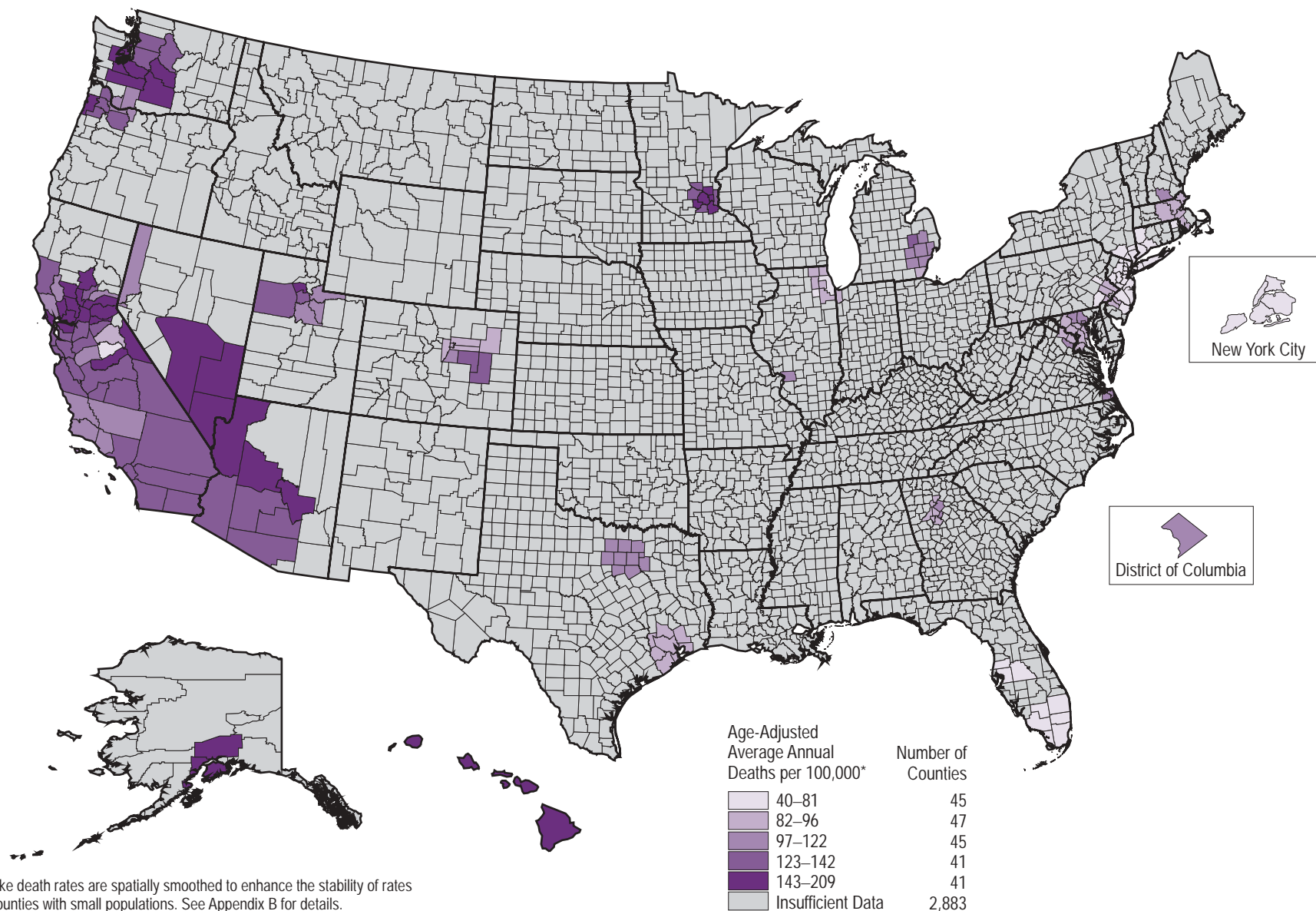
Smoothed County Stroke Death Rates 1991–1998

Asian and Pacific Islander Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

Asian and Pacific Islander Men Ages 35 Years and Older



Blacks

Blacks were the largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.9% of all residents. During 1991–1998, the age-adjusted stroke death rate for blacks in this age group was 166/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all blacks shows considerable geographic disparity across the 1,872 counties for which sufficient data existed to calculate rates. County death rates ranged from 74 to 311/100,000. A greater than twofold difference existed between the midpoint of the highest quintile (261) and the midpoint of the lowest quintile (111). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for blacks (Figure 3.10). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

According to the map, the highest stroke death rates for blacks were reported in counties located primarily in two regions of the Southeast. The first region includes nearly the entire state of South Carolina, much of North Carolina, and many of the southern, rural Georgia counties of the Cotton Belt. The second region is the Mississippi River Valley and Delta, specifically counties in Arkansas, western Mississippi, and western Tennessee. Smaller groupings of counties in the highest quintile were also observed in northeastern Texas, northwestern Illinois, and along the Washington–Idaho border. Counties with low rates were reported primarily in the southwestern states of Nevada, Arizona, and New Mexico, along with parts of the Northeast. Several metropolitan areas had stroke death

rates in the lowest quintile, including Boston, the District of Columbia, New York City, and Philadelphia.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 153/100,000 for black women and 182/100,000 for black men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for black women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For black women, county death rates ranged from 70 to 302/100,000. The range for black men was 84 to 404/100,000. For both women and men, a greater than twofold difference existed between the midpoint of the highest quintile (249 for women, 322 for men) and the midpoint of the lowest quintile (105 for women, 124 for men).

Figure 3.10
Frequency Distribution of
Smoothed County Stroke
Death Rates Among Blacks
Ages ≥ 35 Years,
1991–1998

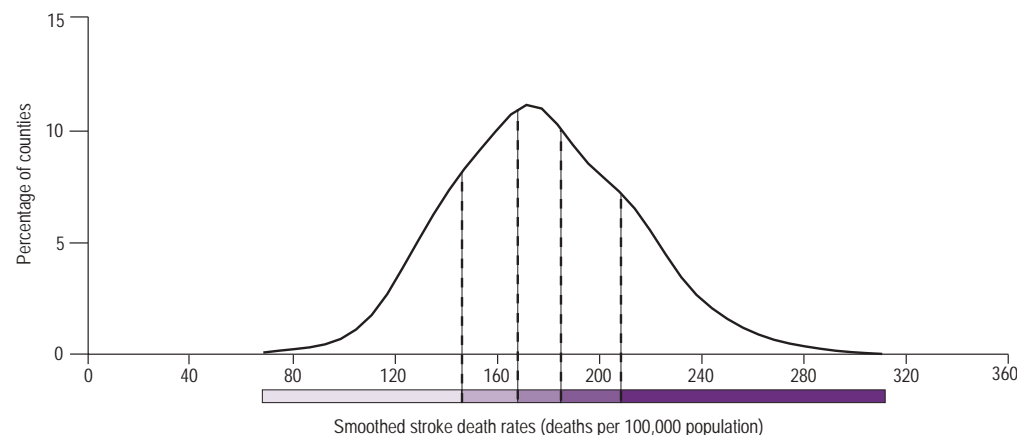
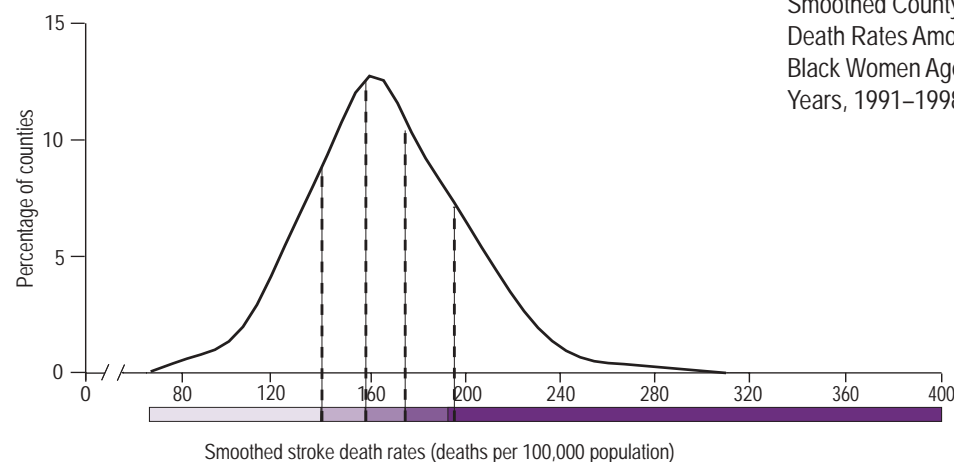


Figure 3.11
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
Black Women Ages ≥35
Years, 1991–1998



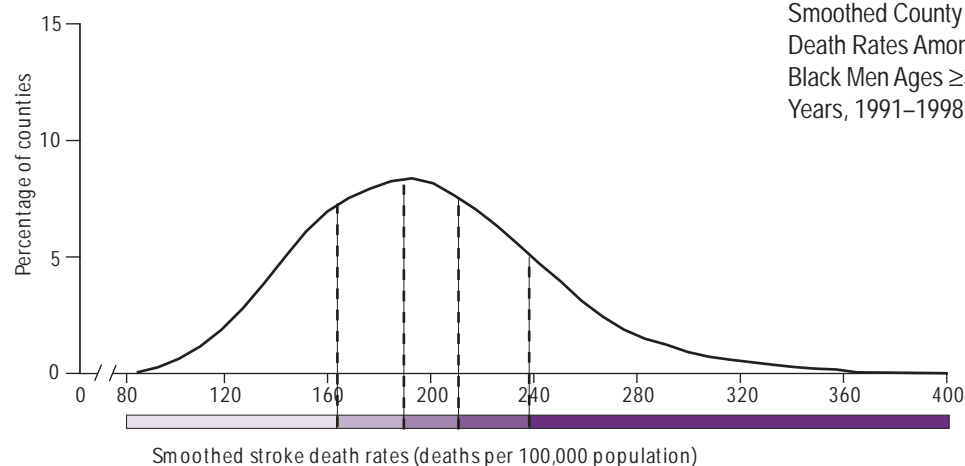
The frequency distributions show the range of smoothed stroke death rates for black women (Figure 3.11) and men (Figure 3.12) in all counties for which rates were calculated.

The maps indicate that for both black women and men, a majority of the counties in the southeastern states were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, Georgia, and Florida) and parts of the Mississippi Delta (as far east as Alabama) had dense concentrations of counties in the highest quintiles for women and men. Differences in the geographic patterns between women and men were observed in the western states. California, Arizona, Nevada, and Washington showed more counties in the top two quintiles for black women than for black men.

A Note on Methods

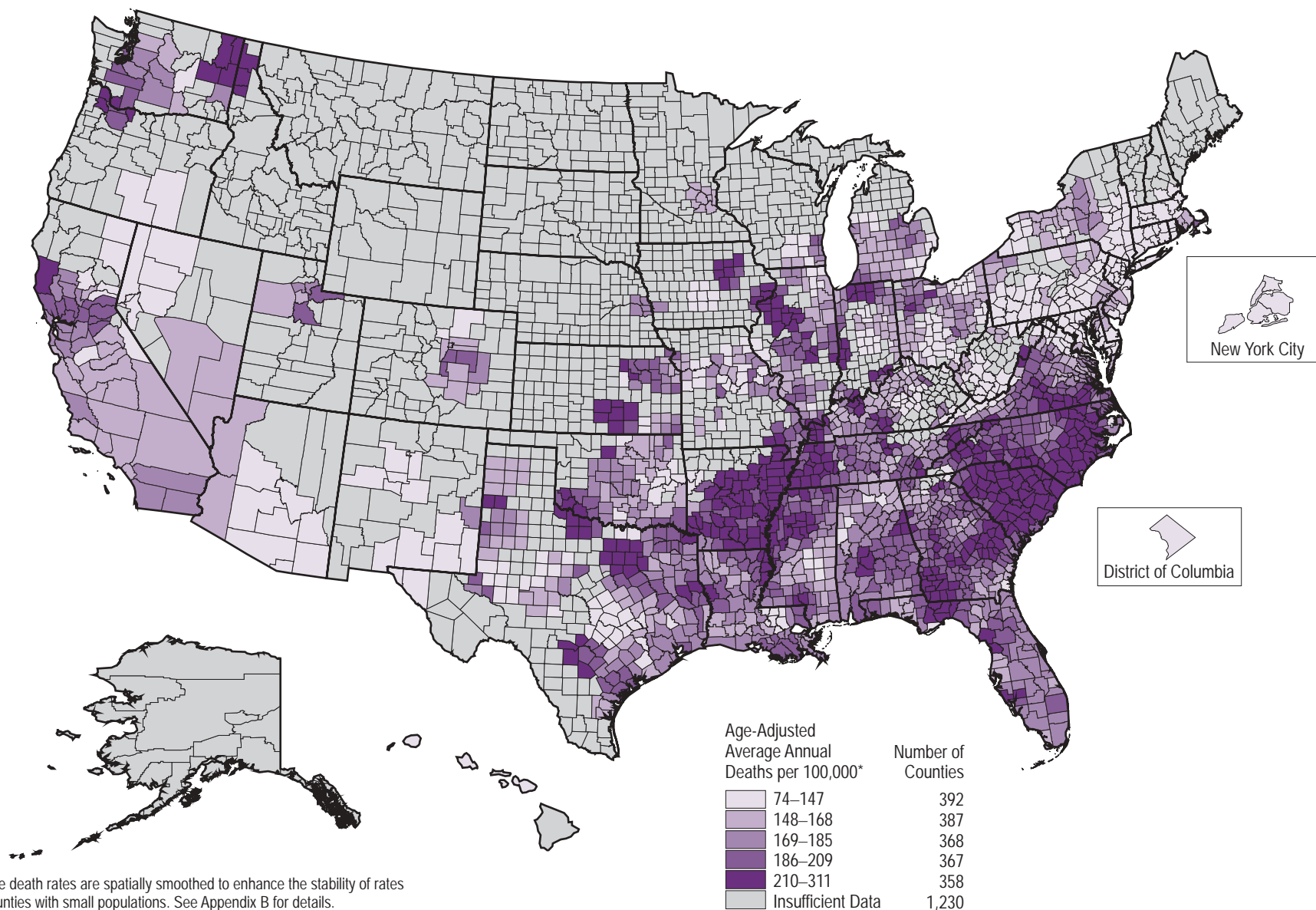
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Figure 3.12
Frequency Distribution of
Smoothed County Stroke
Death Rates Among
Black Men Ages ≥35
Years, 1991–1998



Smoothed County Stroke Death Rates 1991–1998

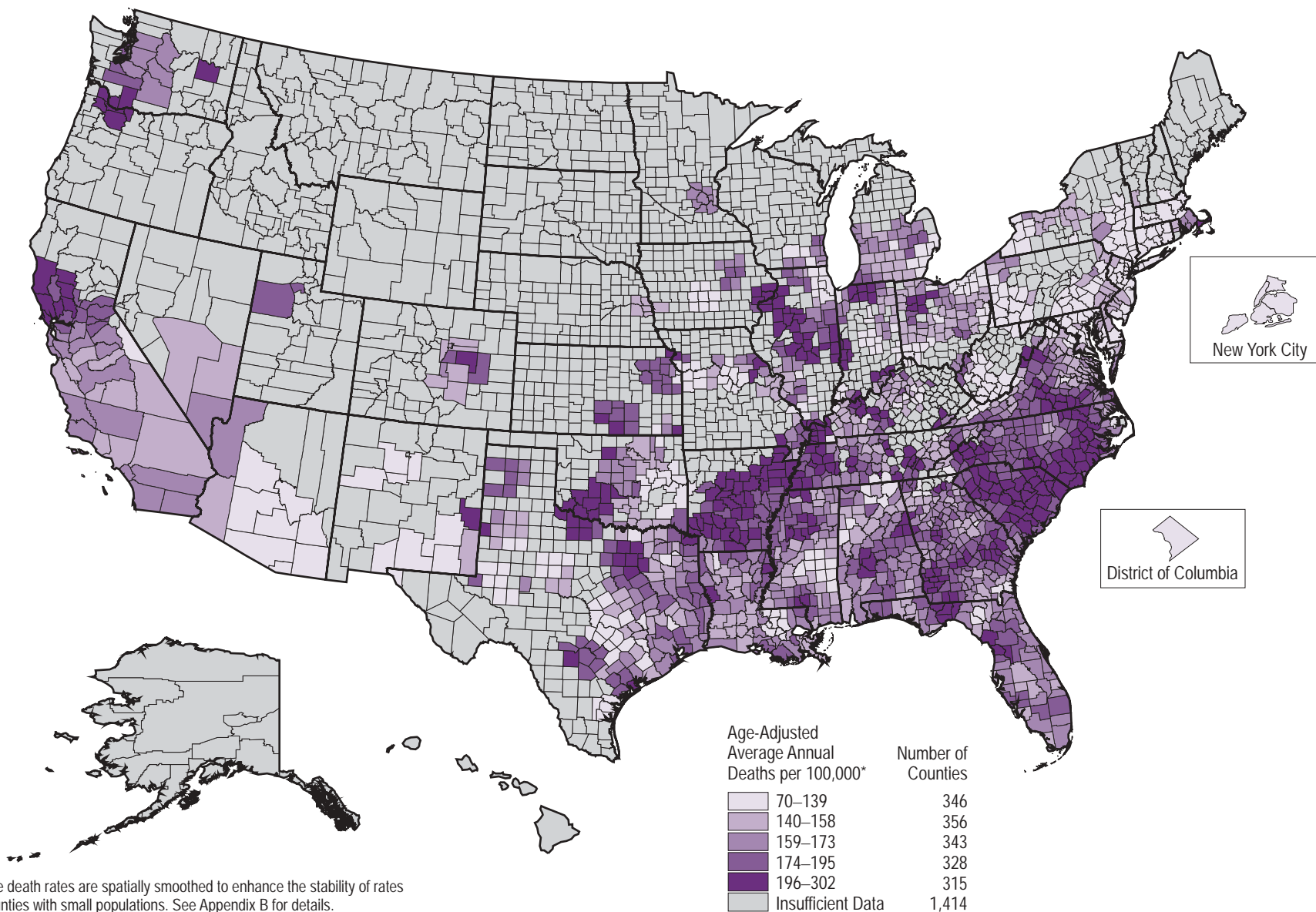
Blacks
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

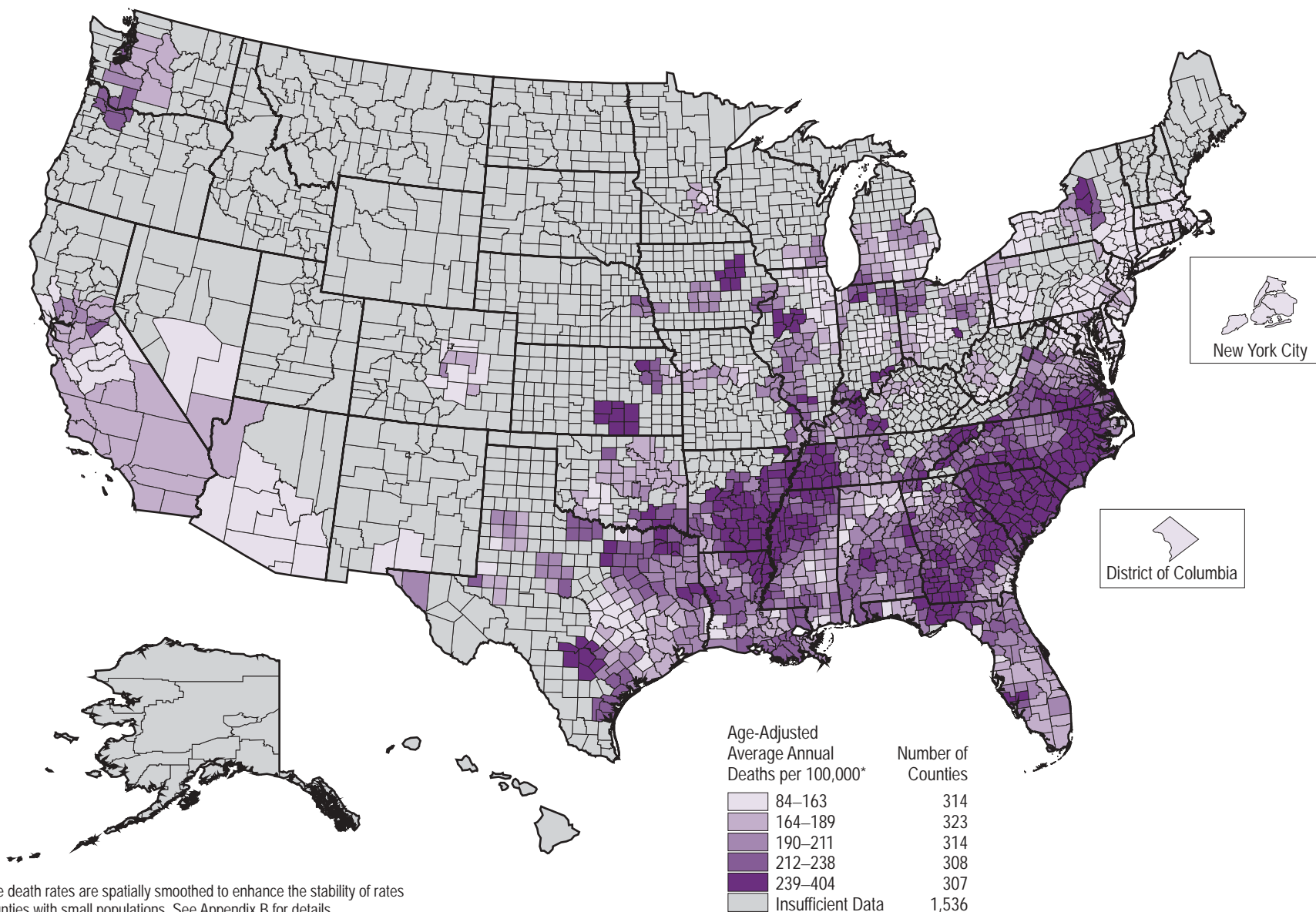
Black Women Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

Black Men
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Hispanics

Hispanics were the second largest racial and ethnic minority group among U.S. residents ages 35 years and older in 2000, making up 12.5% of all residents. During 1991–1998, the age-adjusted stroke death rate for Hispanics in this age group was 79/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all Hispanics shows considerable geographic disparity across the 724 counties for which sufficient data existed to calculate rates. County death rates ranged from 20 to 239/100,000. An approximately fourfold difference existed between the midpoint of the highest quintile (173) and the midpoint of the lowest quintile (41). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

The frequency distribution shows the range of smoothed stroke death rates for Hispanics in all counties for which rates were calculated (Figure 3.13). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

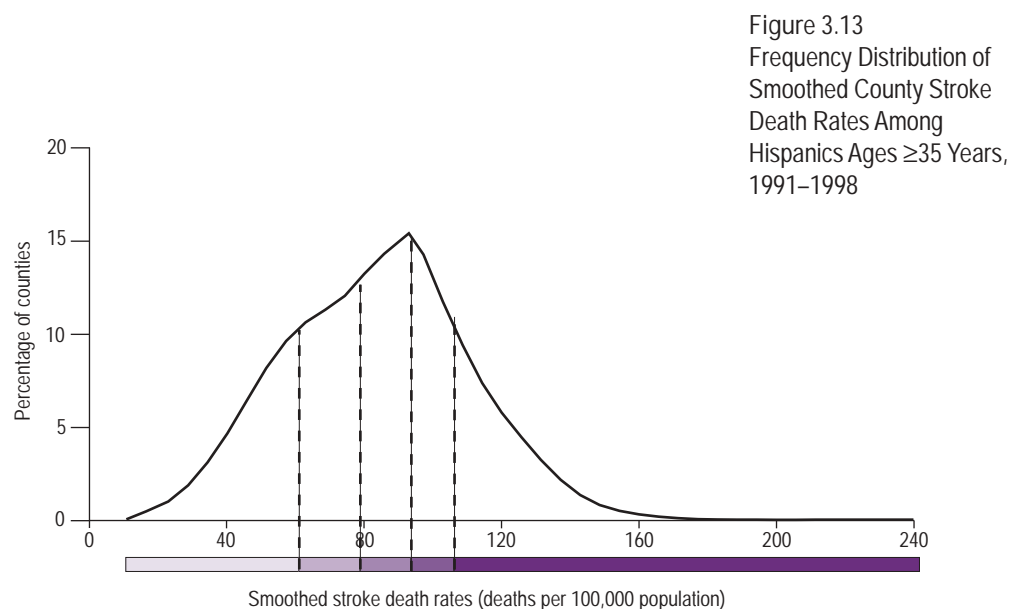
According to the map, the highest stroke death rates for Hispanics were reported primarily in an area that extends from central New Mexico southeast into northwestern and central Texas, with an additional concentration among counties in and around Corpus Christi. Smaller groupings of counties in the highest quintile were also observed in eastern Texas, south-central Colorado, and northern Washington. The majority of counties in the highest three quintiles are located in the southwestern and Pacific states. Although several counties with low rates were reported in northern California and Nevada, most of the lowest rates were observed in the Northeast, southern Florida, and Chicago, Illinois.

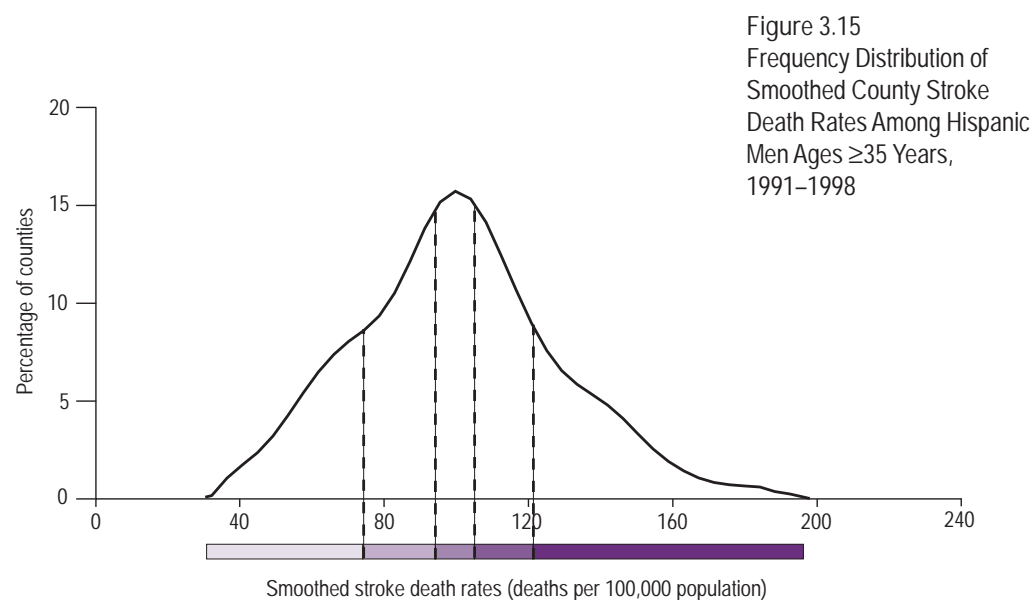
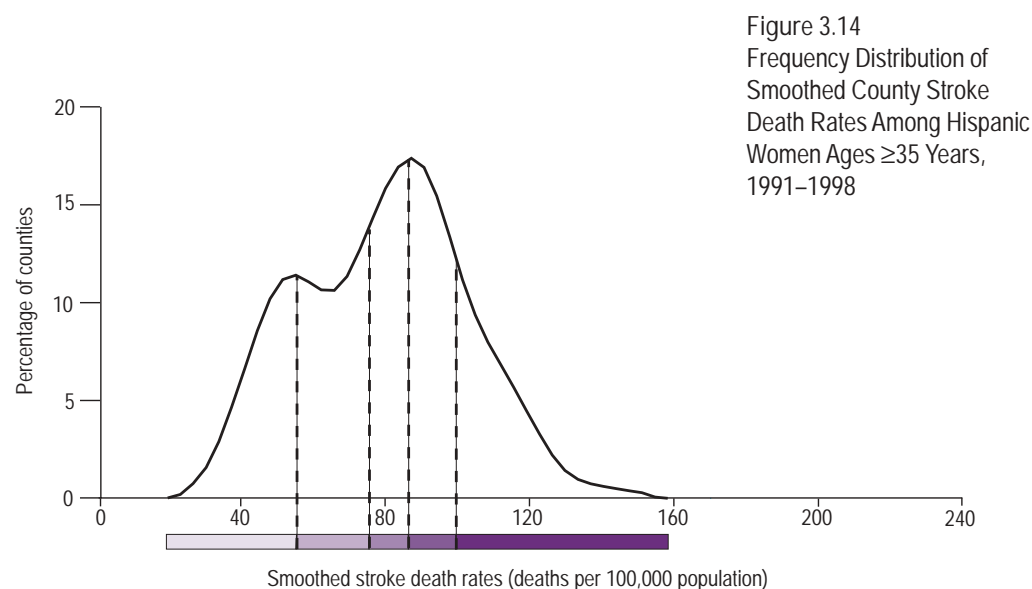
Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 72/100,000 for Hispanic women and 88/100,000 for Hispanic men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for Hispanic women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For Hispanic women, county death rates ranged from 22 to 156/100,000. The range for Hispanic men was 35 to 194/100,000. For both women and men, an approximately threefold difference existed between the midpoint of the highest quintile (128 for women, 159 for men) and the midpoint of the lowest quintile (39 for women, 55 for men).

The frequency distributions show the range of smoothed stroke death rates for Hispanic women (Figure 3.14) and





men (Figure 3.15) in all counties for which rates were calculated.

The maps indicate that the largest concentrations of counties with the highest rates for both Hispanic women and men were reported in the southwestern states and California. New Mexico and California had larger concentrations of counties in the highest quintile for women compared with men, whereas Washington had a larger concentration of counties with high rates for men.

A Note on Methods

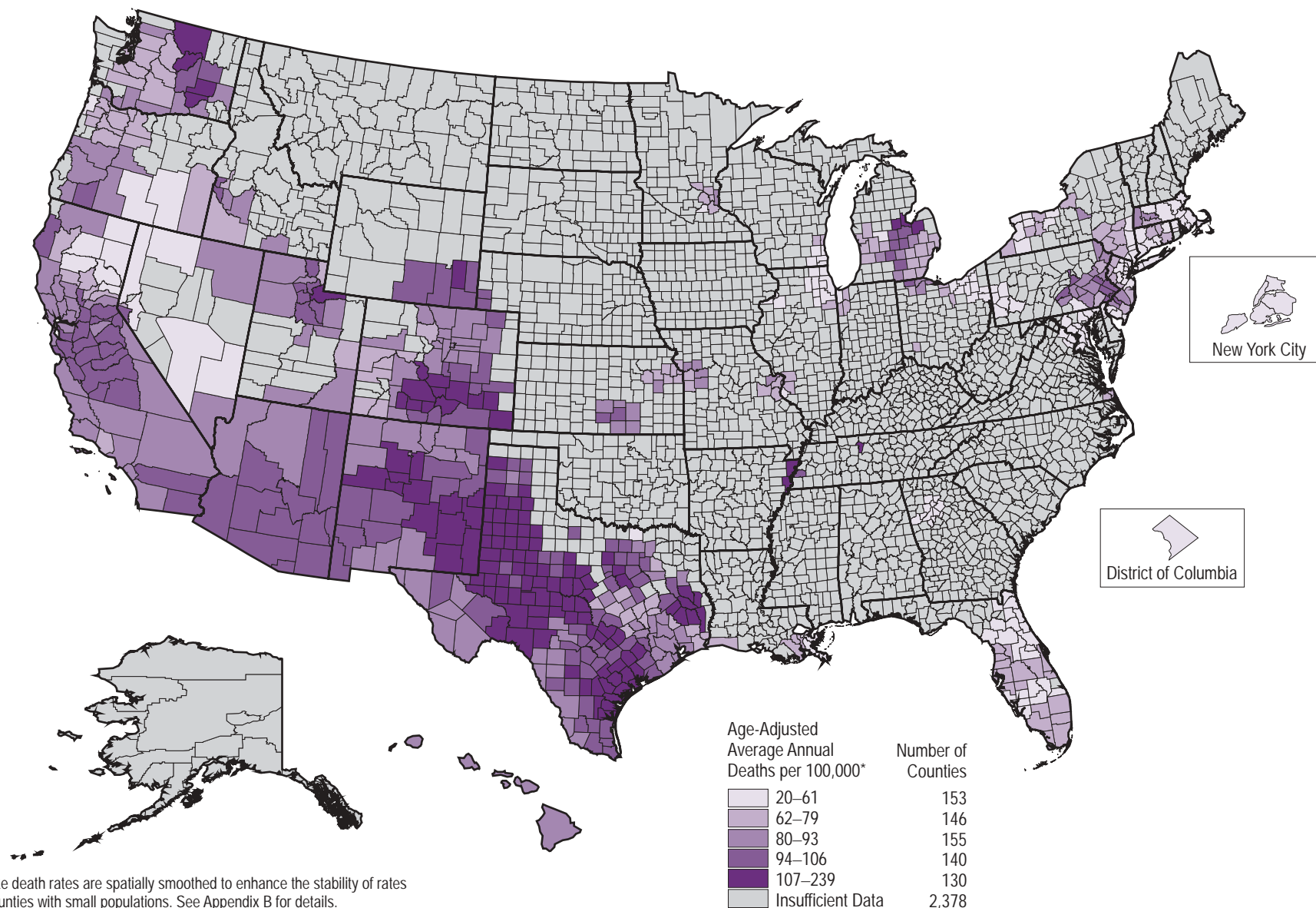
Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

A Cautionary Note

The race and ethnicity of decedents are not always reported accurately on death certificates. Validation studies have reported that Hispanic decedents are sometimes misreported as non-Hispanic on death certificates (see Section 1). Therefore, an unknown proportion of stroke deaths were likely omitted from the calculation of rates for Hispanics. Consequently, the true stroke death rates for this population were probably higher during 1991–1998 than indicated in the figures and maps. In addition, if misreporting of Hispanic origin on death certificates was a greater problem in certain parts of the country, then the geographic patterns presented here could be biased.

Smoothed County Stroke Death Rates 1991–1998

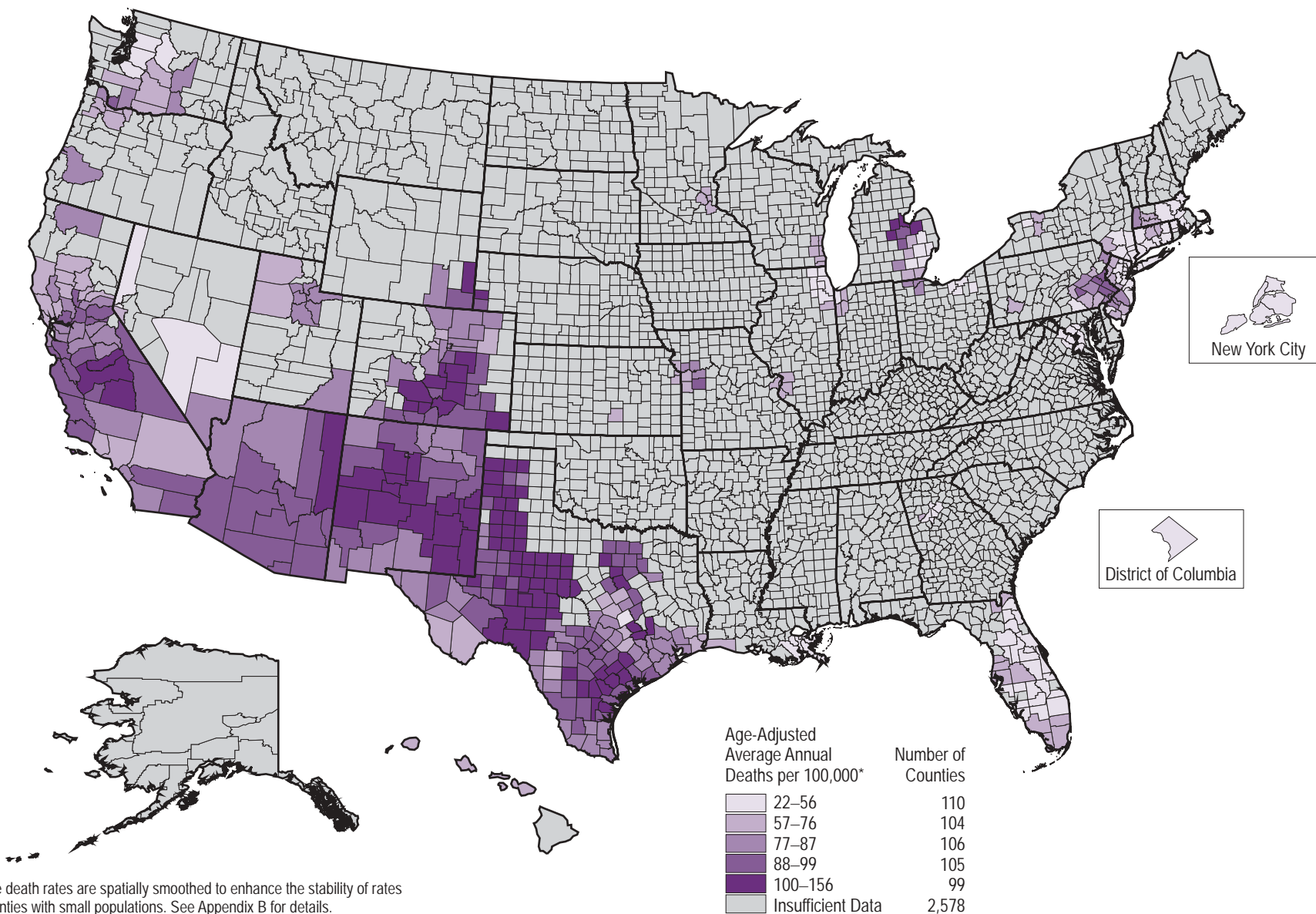
Hispanics
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

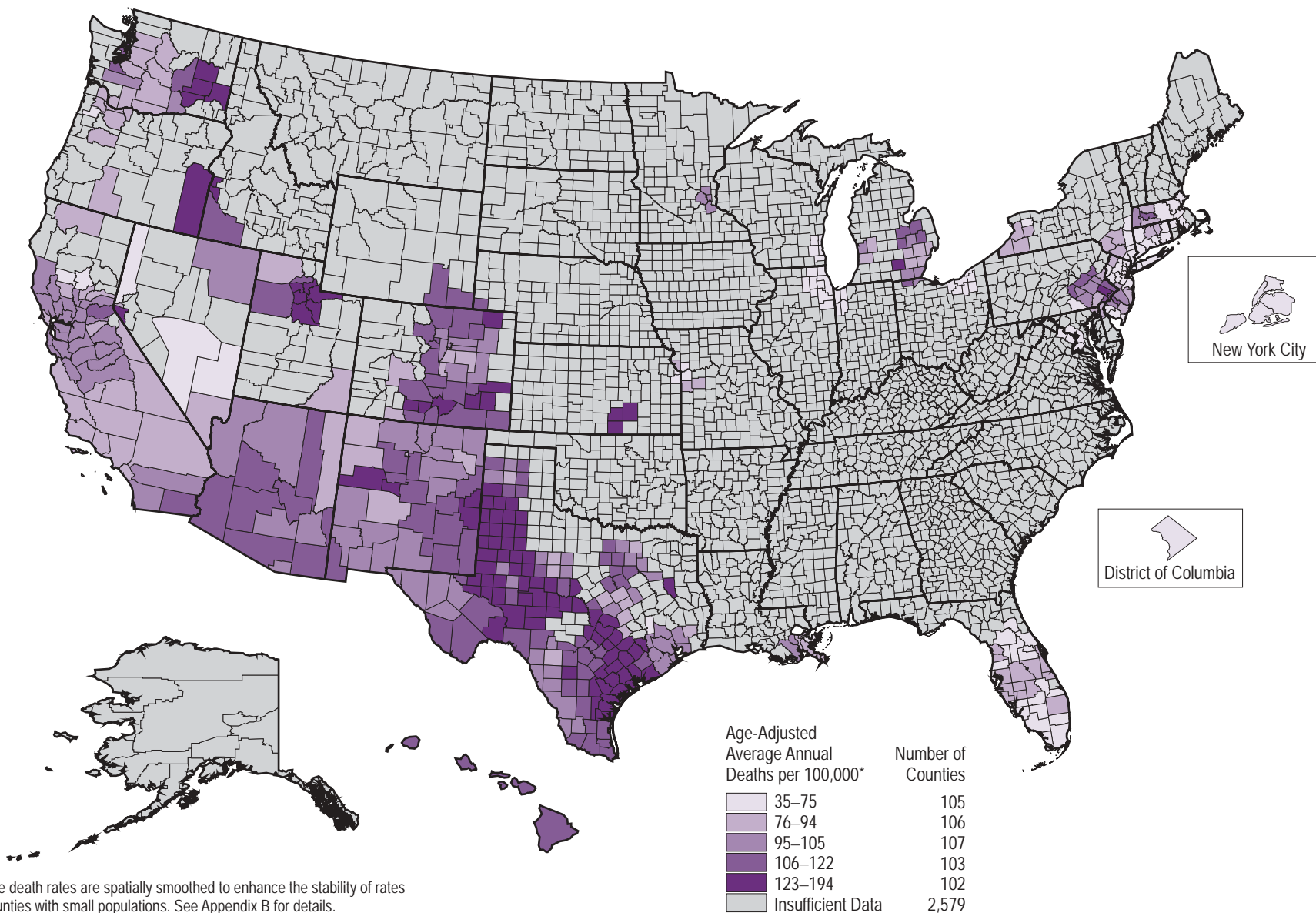
Smoothed County Stroke Death Rates 1991–1998

Hispanic Women Ages 35 Years and Older



Smoothed County Stroke Death Rates 1991–1998

Hispanic Men Ages 35 Years and Older



Whites

Whites made up 77.1% of the U.S. population ages 35 years and older in 2000. During 1991–1998, the age-adjusted stroke death rate for whites in this age group was 117/100,000.

The national map of age-adjusted, spatially smoothed stroke death rates for all whites shows considerable geographic disparity across the 3,095 counties for which sufficient data existed to calculate rates. County death rates ranged from 53 to 231/100,000. An approximately twofold difference existed between the midpoint of the highest quintile (187) and the midpoint of the lowest quintile (83). The quintile ranking for each county is depicted on the national map, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates.

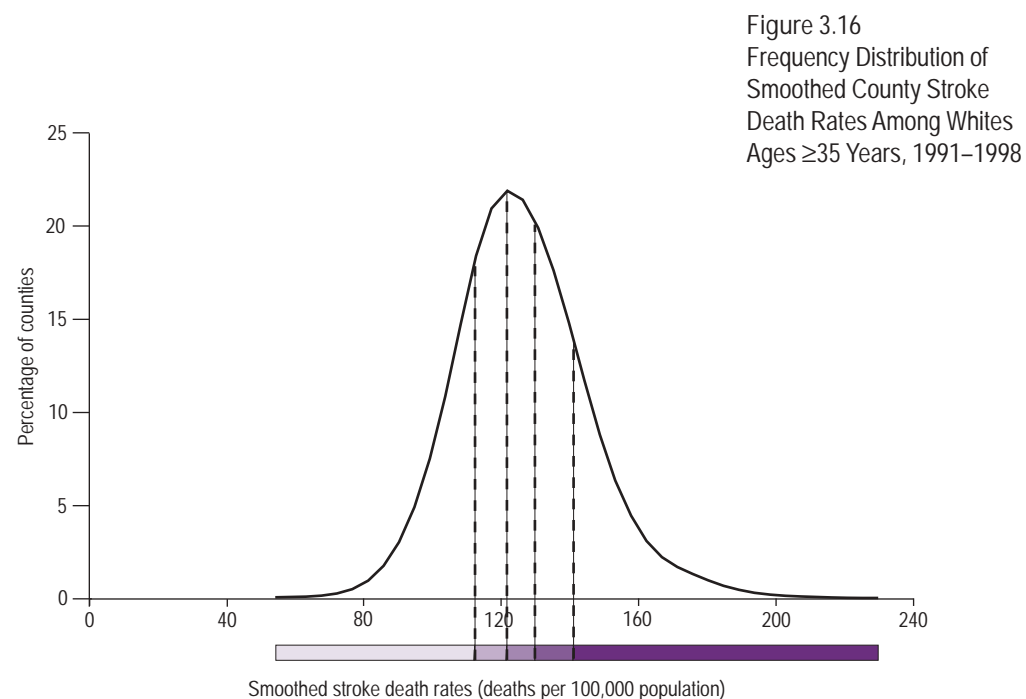
The frequency distribution shows the range of smoothed stroke rates for whites (Figure 3.16). The vertical dotted lines and the graded color bar along the x-axis illustrate the quintiles into which counties were divided on the basis of these rates.

According to the map, the highest stroke death rates for whites were reported in counties concentrated primarily in two areas of the Southeast. The first area encompasses the Piedmont and coastal counties of South Carolina and North Carolina, much of Virginia, and many of the southern, rural Georgia counties of the Cotton Belt. The second area is the Mississippi Delta, including nearly all of Arkansas, northwestern counties of Mississippi, much of Tennessee, and parts of Kentucky. Other groupings of counties in the highest quintile were reported in northern Michigan, northwestern Oregon, and parts of central Texas and around San Francisco. Counties in the lowest quintile were reported primarily in the Northeast, southern Florida, and parts of the Great Plains and Southwest. Alaska and Hawaii also had counties in the lower quintiles.

Women and Men

During 1991–1998, the age-adjusted death rate for stroke was 113/100,000 for white women and 121/100,000 for white men ages 35 years and older.

The maps of age-adjusted, spatially smoothed stroke death rates for white women and men show considerable geographic disparity across the counties for which sufficient data existed to calculate rates. For white women, county death rates ranged from 51 to 229/100,000. The range for white men was 42 to 229/100,000. For both women and men, an approximately twofold difference existed between the midpoint of the highest quintile (184 for women, 189 for men) and the midpoint of the lowest quintile (79 for women, 79 for men).



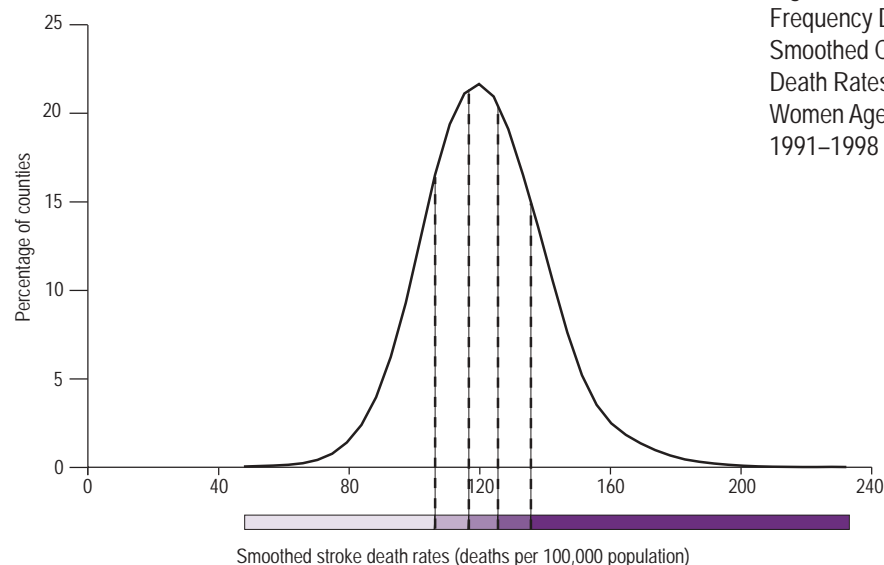


Figure 3.17
Frequency Distribution of
Smoothed County Stroke
Death Rates Among White
Women Ages ≥35 Years,
1991–1998

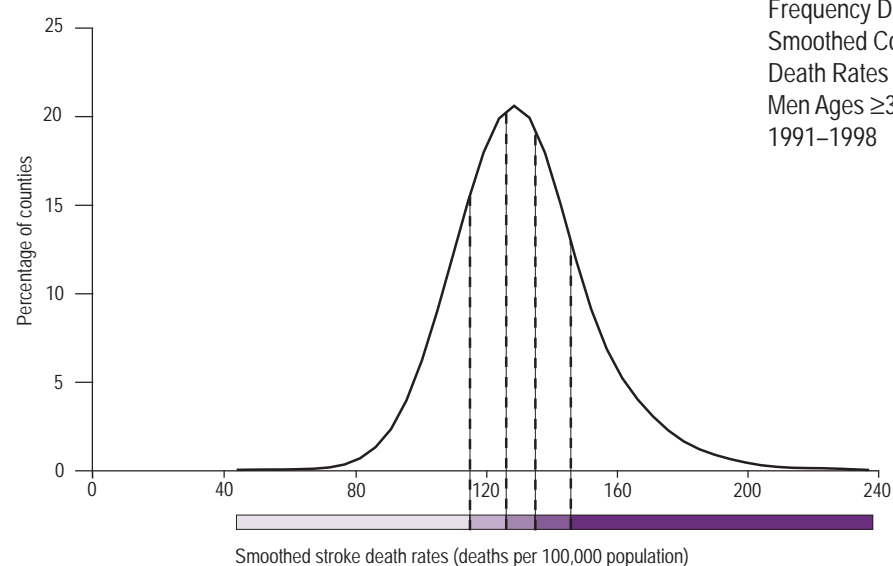


Figure 3.18
Frequency Distribution of
Smoothed County Stroke
Death Rates Among White
Men Ages ≥35 Years,
1991–1998

The frequency distributions show the range of smoothed stroke death rates for white women (Figure 3.17) and men (Figure 3.18) in all counties for which rates were calculated.

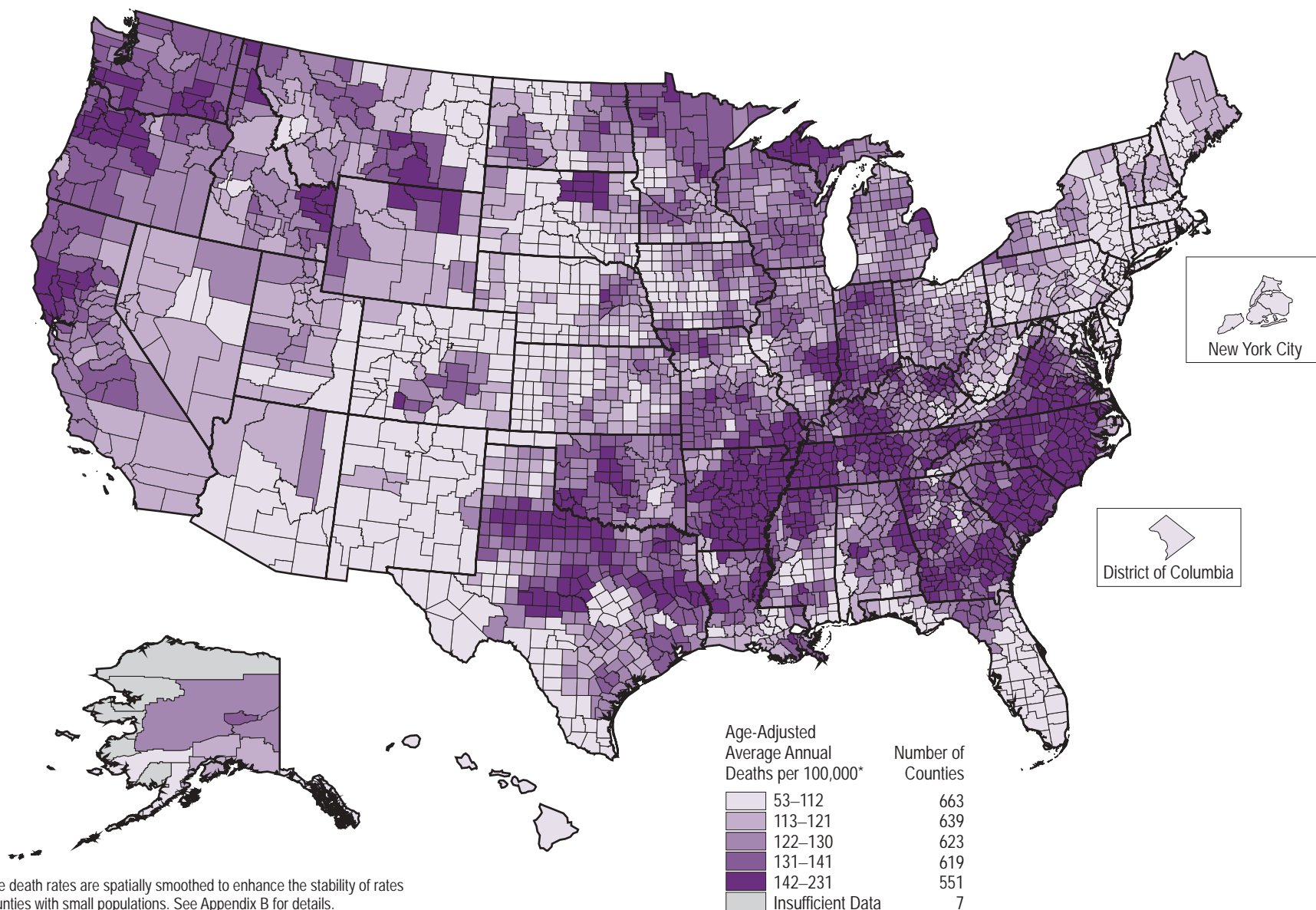
The maps indicate that for both white women and men, a majority of the counties in the southeastern states (except Florida) were in the two highest quintiles of stroke death rates. The southeastern coastal states (Virginia, North Carolina, South Carolina, and Georgia) and parts of the Mississippi Delta had dense concentrations of counties in the highest quintiles for white women and white men. Differences in the geographic patterns between women and men were observed in the midwestern and western states. For white women, many of the counties in the western states were in the highest quintile. For white men, western counties in the highest quintiles were concentrated primarily in the Pacific Northwest and northern California; concentrations of counties with high rates also were observed in North Dakota and South Dakota.

A Note on Methods

Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification* (codes 430–438) (Washington, DC: Department of Health and Human Services; 1980). Stroke death rates were age-adjusted to the 2000 U.S. population and spatially smoothed using a spatial moving average. A detailed explanation of the methods used to generate these death rates and create the maps can be found in Appendix B.

Smoothed County Stroke Death Rates 1991–1998

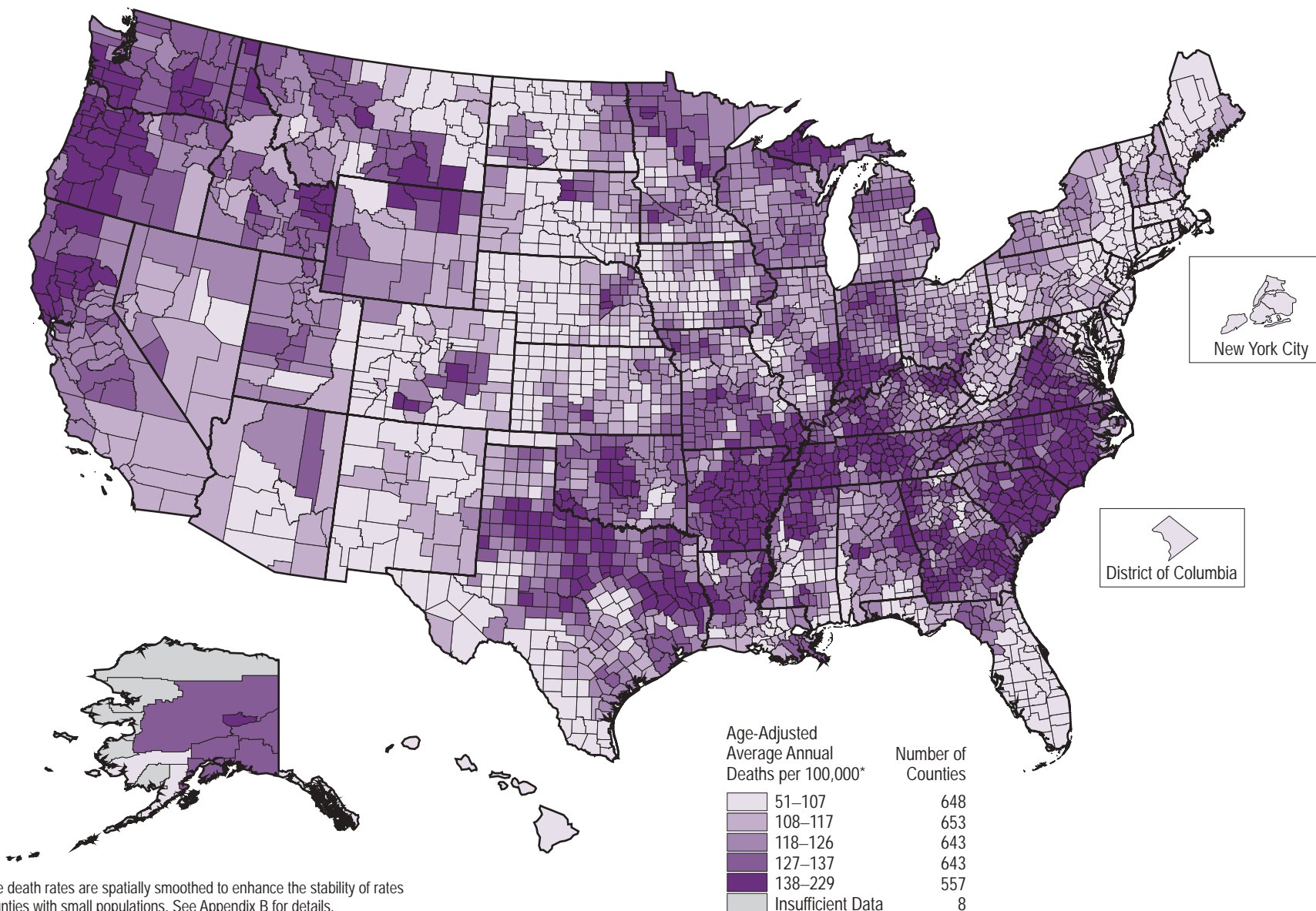
Whites
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

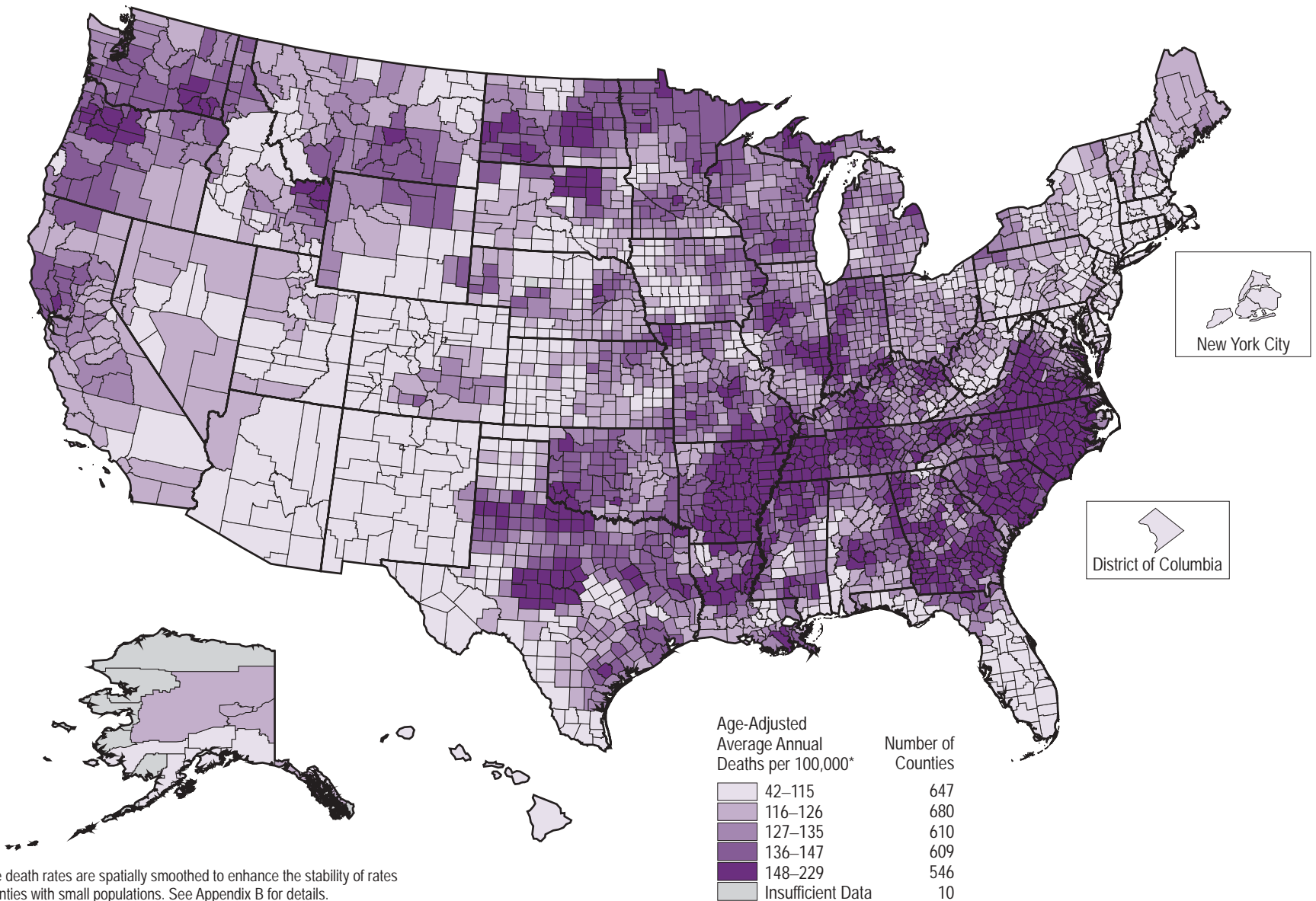
White Women
Ages 35 Years and Older



*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

Smoothed County Stroke Death Rates 1991–1998

White Men
Ages 35 Years and Older



Miners leave their shift at the Meadow River
Coal Mine in Lookout, West Virginia.



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4 State Maps and Tables of Stroke Mortality

In this section, state maps of the spatially smoothed, age-adjusted stroke death rates by county are presented separately for each state, the District of Columbia, and New York City. To create these state maps, we used the same stroke death rates generated for the national maps. A description of the methods used to calculate the rates can be found in Appendix B. Each county rate is based on a spatial moving average of that county and its neighbors. Therefore, for counties that are located along state borders, neighboring counties in adjacent states contributed to the smoothed rate for those counties, even though the neighboring counties are not displayed on the state map. State maps of the geographic disparities within each racial and ethnic group are not included in this publication but are available on the CDC interactive Web site at www.cdc.gov/cvh/maps.

For each map, the spatially smoothed, age-adjusted county death rates within each state were ranked from highest to lowest and then categorized into quintiles. The legend that accompanies each map indicates the range of county rates. A graded color scheme differentiates each quintile, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates. Counties for which insufficient data existed to calculate a rate are shaded gray.

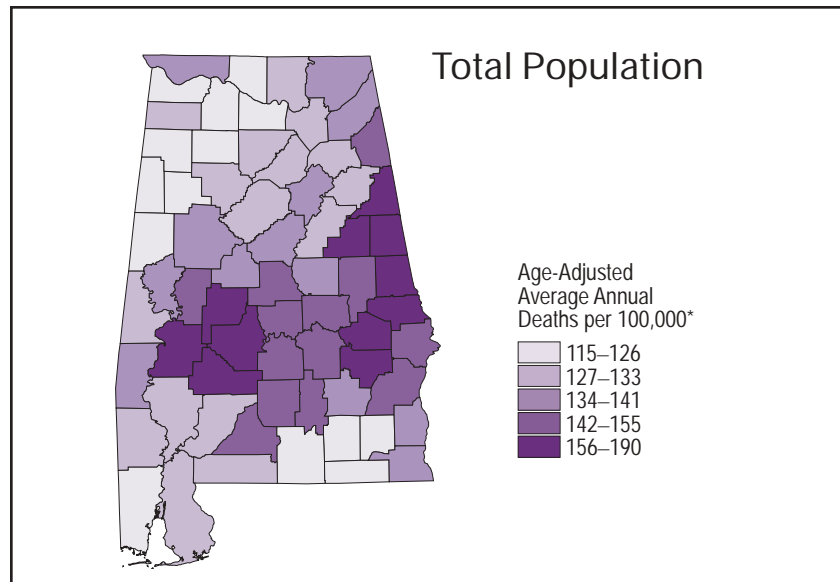
Because the range of stroke death rates varies substantially by state, the quintile cutpoints are different for each state map. Consequently, the range of values represented by a

given quintile varies from map to map. To determine whether the death rates were higher or lower for one state compared with another, the reader can refer to the tables of death rates presented for each state in this section or to the tables in Appendix A.

The state maps are accompanied by tables that display summary data by racial and ethnic group for women and men separately as well as for the state population as a whole. Each table provides data on the state population, the state stroke death rate, and the corresponding national stroke death rate. Data in these tables are not spatially smoothed. Under the federal data-reporting scheme, “Hispanic” is considered a designation of ethnicity, not race. Therefore, data for Hispanics are presented twice in the state tables and throughout the *Atlas of Stroke Mortality*—once under the category of “Hispanics,” which includes Hispanics of all racial identities (e.g., Hispanic blacks, Hispanic whites), and again under any of the four racial categories (American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and whites) according to a person’s racial identity. Consequently, data for the five racial and ethnic groups are not mutually exclusive.

For part of the study period, Oklahoma and New Hampshire did not collect data on Hispanic origin on death certificates. Consequently, we were unable to report stroke death rates for Hispanics in these states.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,758	‡	79
Asians and Pacific Islanders	11,453	‡	105
Blacks	475,760	180	166
Hispanics [§]	14,463	47	79
Whites	1,722,420	124	117
Total Population	2,216,391	135	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,591	‡	77
Asians and Pacific Islanders	6,521	‡	96
Blacks	271,858	162	153
Hispanics [§]	7,043	55	72
Whites	916,014	120	113
All Women	1,197,984	128	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,167	‡	80
Asians and Pacific Islanders	4,932	‡	118
Blacks	203,902	205	182
Hispanics [§]	7,420	‡	88
Whites	806,406	129	121
All Men	1,018,407	142	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

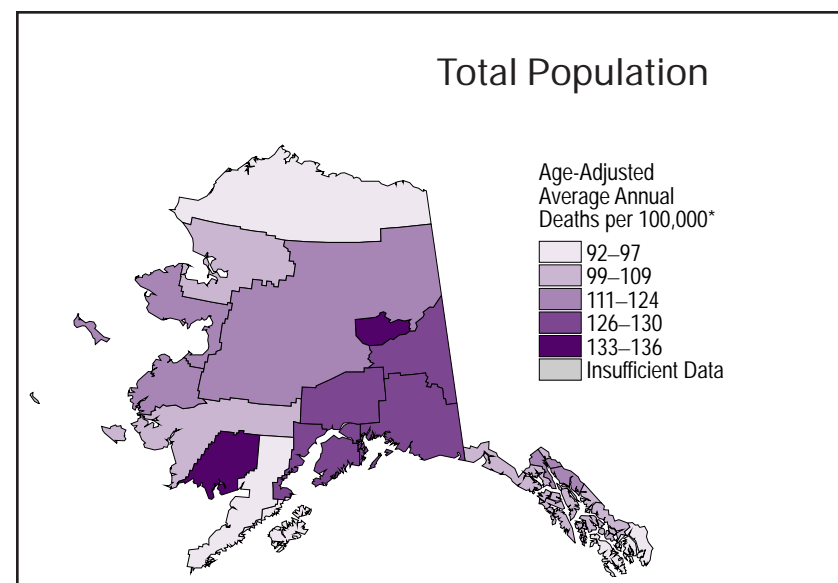
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Alaska

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	32,325	158	79
Asians and Pacific Islanders	11,424	158	105
Blacks	8,398	†	166
Hispanics [§]	8,218	†	79
Whites	224,935	118	117
Total Population	277,082	125	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	16,073	177	77
Asians and Pacific Islanders	6,379	136	96
Blacks	3,911	†	153
Hispanics [§]	3,947	†	72
Whites	103,230	123	113
All Women	129,593	131	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	16,252	133	80
Asians and Pacific Islanders	5,045	201	118
Blacks	4,487	†	182
Hispanics [§]	4,271	†	88
Whites	121,705	110	121
All Men	147,489	116	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

† Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

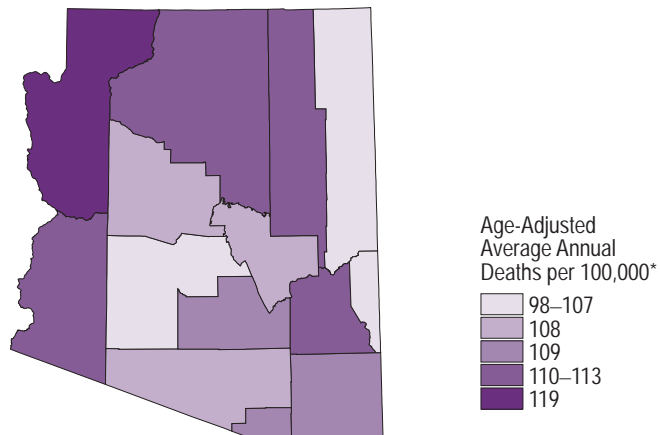
standard 2000 U.S. population.

† Insufficient data to calculate a stroke death rate.

§ Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	83,595	101	79
Asians and Pacific Islanders	38,740	113	105
Blacks	66,157	127	166
Hispanics [§]	337,549	102	79
Whites	2,101,803	108	117
Total Population	2,290,295	108	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	44,656	98	77
Asians and Pacific Islanders	21,873	99	96
Blacks	33,283	127	153
Hispanics [§]	173,582	94	72
Whites	1,096,340	107	113
All Women	1,196,152	108	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	38,939	106	80
Asians and Pacific Islanders	16,867	130	118
Blacks	32,874	125	182
Hispanics [§]	163,967	111	88
Whites	1,005,463	106	121
All Men	1,094,143	107	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

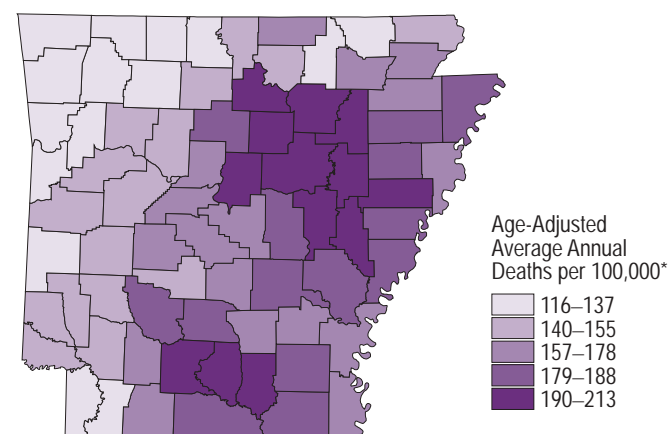
Stroke Death Rates, 1991–1998

Arkansas

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,752	‡	79
Asians and Pacific Islanders	6,972	‡	105
Blacks	159,310	225	166
Hispanics [§]	13,877	‡	79
Whites	1,123,662	157	117
Total Population	1,295,696	163	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,010	‡	77
Asians and Pacific Islanders	3,937	‡	96
Blacks	90,977	207	153
Hispanics [§]	6,686	‡	72
Whites	597,319	151	113
All Women	695,243	158	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,742	‡	80
Asians and Pacific Islanders	3,035	‡	118
Blacks	68,333	248	182
Hispanics [§]	7,191	‡	88
Whites	526,343	161	121
All Men	600,453	168	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

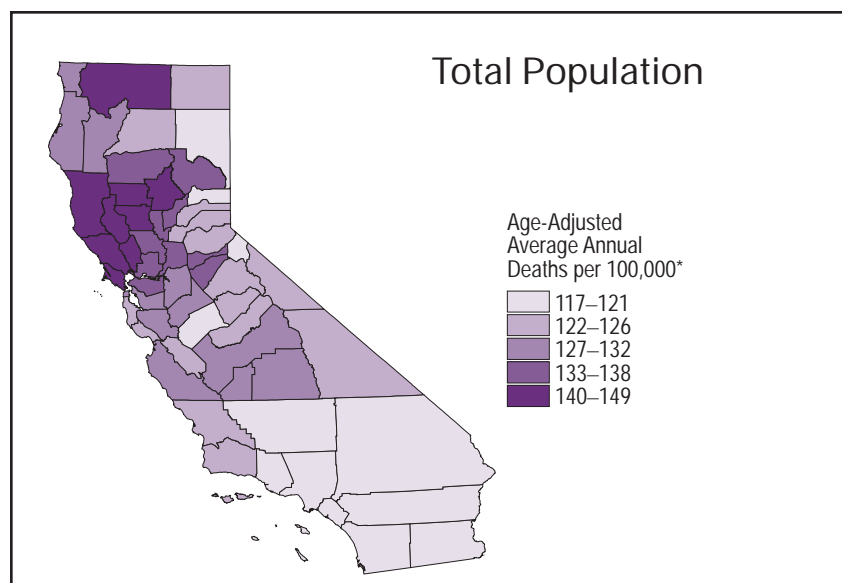
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	133,613	51	79
Asians and Pacific Islanders	1,768,624	118	105
Blacks	1,058,338	169	166
Hispanics [§]	3,279,030	87	79
Whites	12,430,753	121	117
Total Population	15,391,328	124	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	69,857	53	77
Asians and Pacific Islanders	954,477	106	96
Blacks	558,578	165	153
Hispanics [§]	1,666,525	81	72
Whites	6,413,760	119	113
All Women	7,996,672	121	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	63,756	48	80
Asians and Pacific Islanders	814,147	134	118
Blacks	499,760	173	182
Hispanics [§]	1,612,505	93	88
Whites	6,016,993	123	121
All Men	7,394,656	126	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

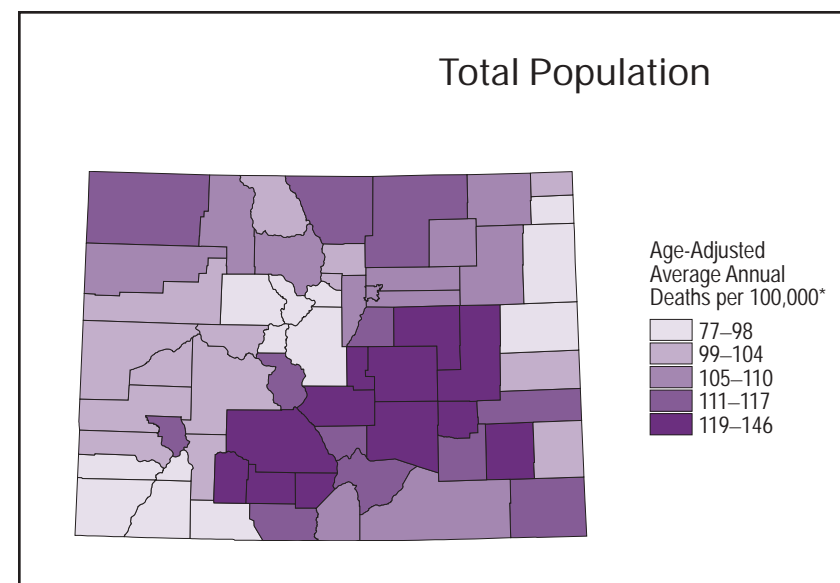
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Colorado

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	14,954	59	79
Asians and Pacific Islanders	38,309	82	105
Blacks	71,853	151	166
Hispanics [§]	213,209	96	79
Whites	1,889,906	111	117
Total Population	2,015,022	112	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,731	75	77
Asians and Pacific Islanders	21,794	75	96
Blacks	35,887	152	153
Hispanics [§]	108,691	89	72
Whites	975,949	111	113
All Women	1,041,361	112	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,223	‡	80
Asians and Pacific Islanders	16,515	93	118
Blacks	35,966	141	182
Hispanics [§]	104,518	107	88
Whites	913,957	109	121
All Men	973,661	109	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

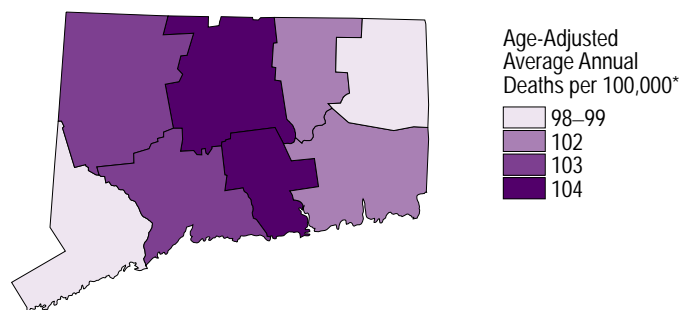
standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,386	‡	79
Asians and Pacific Islanders	32,080	66	105
Blacks	124,275	121	166
Hispanics [§]	91,096	56	79
Whites	1,581,206	101	117
Total Population	1,740,947	103	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,778	‡	77
Asians and Pacific Islanders	16,673	74	96
Blacks	69,310	115	153
Hispanics [§]	49,147	52	72
Whites	841,738	97	113
All Women	929,499	98	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,608	‡	80
Asians and Pacific Islanders	15,407	55	118
Blacks	54,965	125	182
Hispanics [§]	41,949	61	88
Whites	739,468	106	121
All Men	811,448	107	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

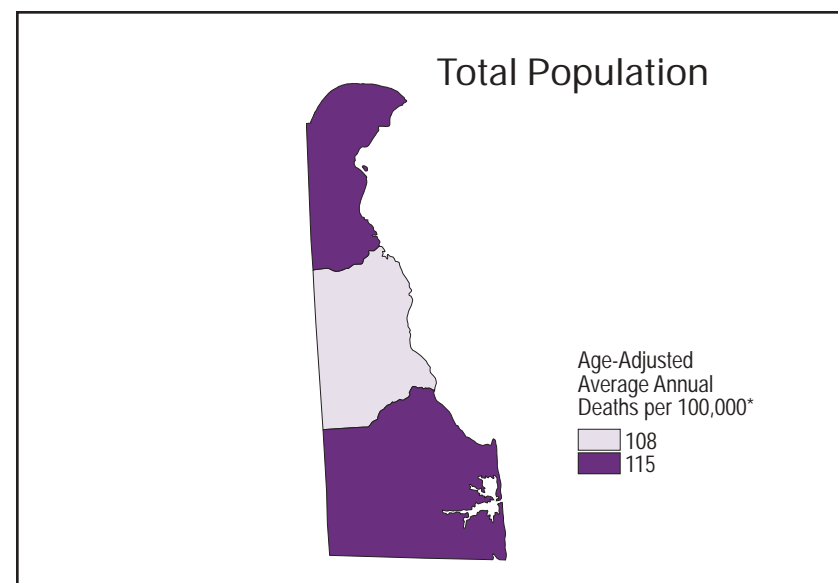
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Delaware

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,077	‡	79
Asians and Pacific Islanders	6,772	‡	105
Blacks	60,332	153	166
Hispanics [§]	8,204	‡	79
Whites	312,354	100	117
Total Population	380,535	106	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	559	‡	77
Asians and Pacific Islanders	3,645	‡	96
Blacks	33,275	144	153
Hispanics [§]	4,094	‡	72
Whites	164,049	96	113
All Women	201,528	102	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	518	‡	80
Asians and Pacific Islanders	3,127	‡	118
Blacks	27,057	164	182
Hispanics [§]	4,110	‡	88
Whites	148,305	102	121
All Men	179,007	109	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

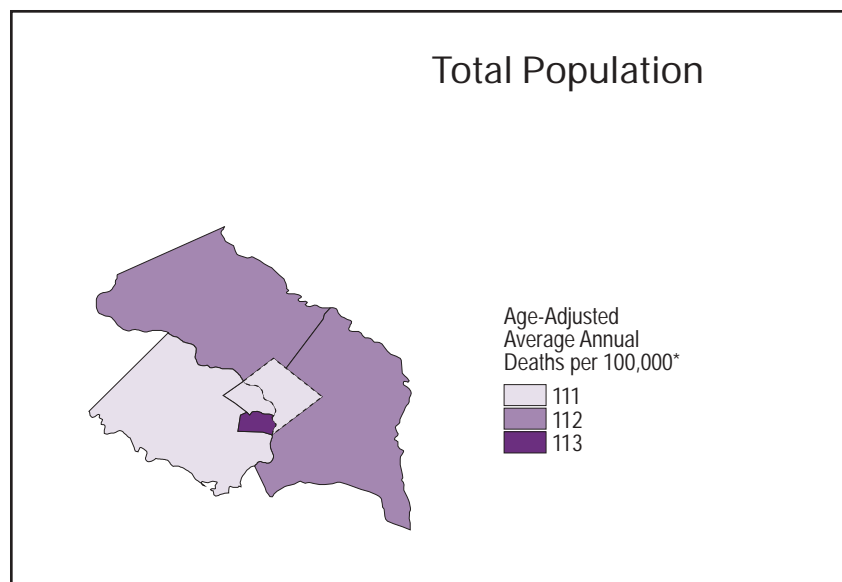
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	776	‡	79
Asians and Pacific Islanders	6,370	‡	105
Blacks	178,359	132	166
Hispanics [§]	14,934	‡	79
Whites	92,816	93	117
Total Population	278,321	120	121

Women			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	433	‡	77
Asians and Pacific Islanders	3,630	‡	96
Blacks	102,412	123	153
Hispanics [§]	7,802	‡	72
Whites	47,130	87	113
All Women	153,605	113	117

Men			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	343	‡	80
Asians and Pacific Islanders	2,740	‡	118
Blacks	75,947	144	182
Hispanics [§]	7,132	‡	88
Whites	45,686	102	121
All Men	124,716	129	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

District of Columbia

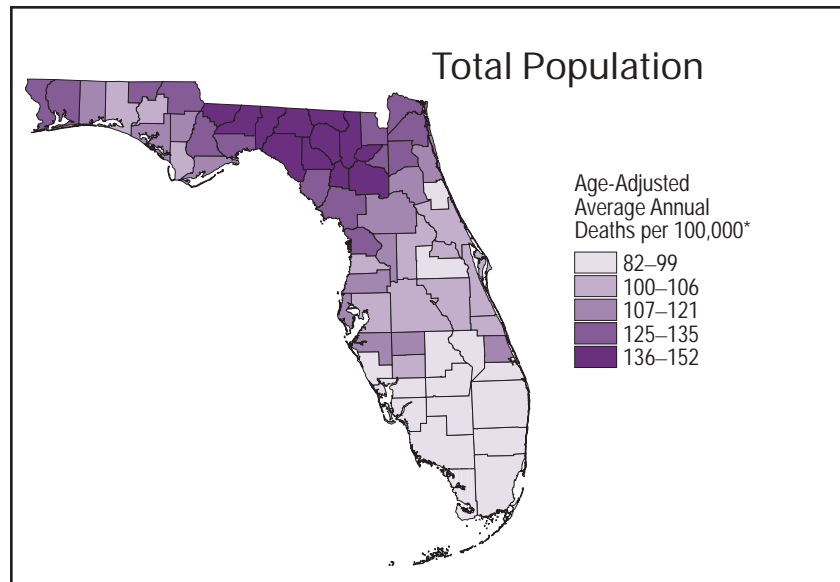
The map of stroke death rates for the District of Columbia displays spatially smoothed, age-adjusted rates for the District of Columbia and all contiguous counties of the bordering states. The border of the District of Columbia is represented by a dashed line. The stroke death rates presented in the tables are not spatially smoothed and therefore do not incorporate data from the contiguous counties.

Latinos celebrate their culture
at an annual festival in the District of Columbia.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	26,073	34	79
Asians and Pacific Islanders	119,163	55	105
Blacks	895,601	181	166
Hispanics [§]	1,062,845	66	79
Whites	7,202,542	97	117
Total Population	8,243,379	102	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	13,263	‡	77
Asians and Pacific Islanders	66,947	53	96
Blacks	492,461	170	153
Hispanics [§]	567,759	61	72
Whites	3,820,822	93	113
All Women	4,393,493	98	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	12,810	41	80
Asians and Pacific Islanders	52,216	57	118
Blacks	403,140	194	182
Hispanics [§]	495,086	73	88
Whites	3,381,720	100	121
All Men	3,849,886	106	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.
[‡]Insufficient data to calculate a stroke death rate.
[§]Includes data for Hispanics in all racial groups.

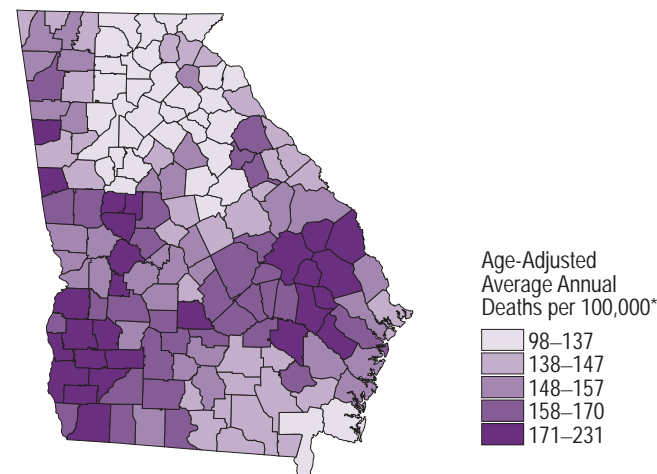
Stroke Death Rates, 1991–1998

Georgia

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,026	‡	79
Asians and Pacific Islanders	59,519	93	105
Blacks	871,811	191	166
Hispanics [§]	66,638	43	79
Whites	2,704,908	134	117
Total Population	3,644,264	146	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,060	‡	77
Asians and Pacific Islanders	32,097	85	96
Blacks	491,907	171	153
Hispanics [§]	32,331	45	72
Whites	1,414,393	129	113
All Women	1,942,457	138	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,966	‡	80
Asians and Pacific Islanders	27,422	103	118
Blacks	379,904	219	182
Hispanics [§]	34,307	40	88
Whites	1,290,515	141	121
All Men	1,701,807	155	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

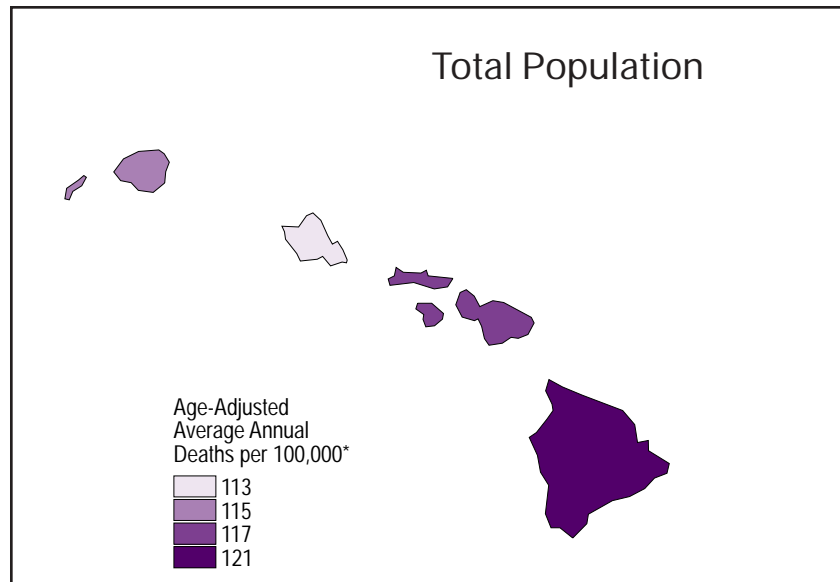
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,545	‡	79
Asians and Pacific Islanders	403,858	129	105
Blacks	10,656	74	166
Hispanics [§]	35,738	89	79
Whites	203,566	87	117
Total Population	620,625	116	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,231	‡	77
Asians and Pacific Islanders	214,449	113	96
Blacks	4,707	‡	153
Hispanics [§]	17,816	67	72
Whites	99,057	84	113
All Women	319,444	105	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,314	‡	80
Asians and Pacific Islanders	189,409	147	118
Blacks	5,949	‡	182
Hispanics [§]	17,922	111	88
Whites	104,509	86	121
All Men	301,181	129	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

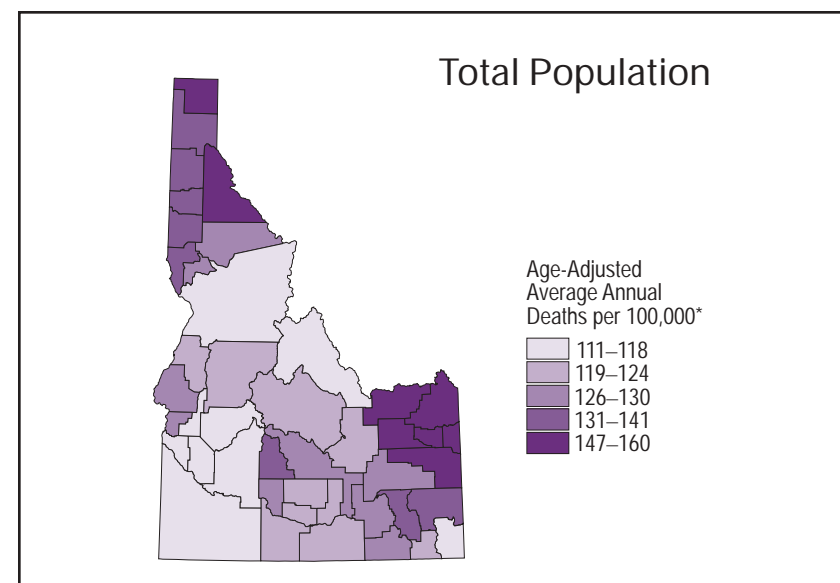
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Idaho

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,033	119	79
Asians and Pacific Islanders	5,029	145	105
Blacks	2,244	†	166
Hispanics [§]	24,662	89	79
Whites	574,551	128	117
Total Population	587,857	129	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,159	†	77
Asians and Pacific Islanders	2,828	†	96
Blacks	1,004	†	153
Hispanics [§]	11,635	77	72
Whites	294,314	130	113
All Women	301,305	130	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,874	†	80
Asians and Pacific Islanders	2,201	†	118
Blacks	1,240	†	182
Hispanics [§]	13,027	104	88
Whites	280,237	125	121
All Men	286,552	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

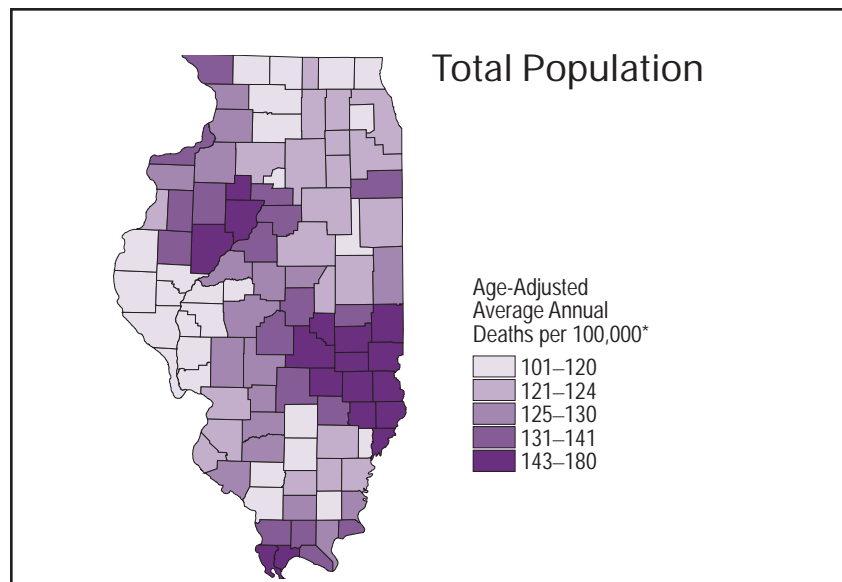
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	11,930	‡	79
Asians and Pacific Islanders	177,868	69	105
Blacks	763,896	153	166
Hispanics [§]	399,799	56	79
Whites	5,066,948	121	117
Total Population	6,020,642	125	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,101	‡	77
Asians and Pacific Islanders	94,488	61	96
Blacks	432,955	143	153
Hispanics [§]	197,533	49	72
Whites	2,675,419	115	113
All Women	3,208,963	118	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,829	‡	80
Asians and Pacific Islanders	83,380	79	118
Blacks	330,941	166	182
Hispanics [§]	202,266	65	88
Whites	2,391,529	129	121
All Men	2,811,679	133	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

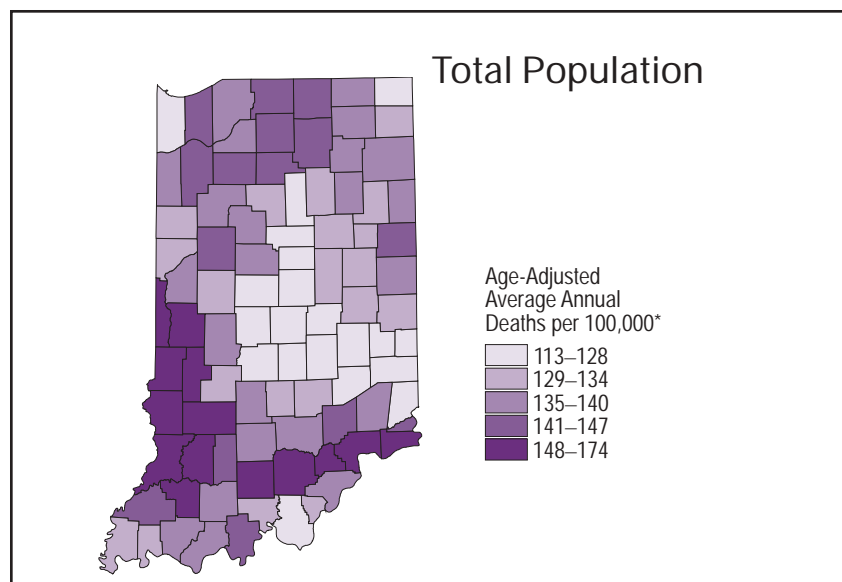
[§]Includes data for Hispanics in all racial groups.

African American men came from across the country to participate in the 1995 Million Man March in the District of Columbia to advocate for unity, atonement, and brotherhood.



© Rick Reinhard

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,646	‡	79
Asians and Pacific Islanders	21,843	57	105
Blacks	205,260	162	166
Hispanics [§]	50,036	60	79
Whites	2,742,701	136	117
Total Population	2,976,450	138	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,401	‡	77
Asians and Pacific Islanders	11,809	63	96
Blacks	113,629	151	153
Hispanics [§]	25,075	49	72
Whites	1,454,290	132	113
All Women	1,583,129	134	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,245	‡	80
Asians and Pacific Islanders	10,034	‡	118
Blacks	91,631	176	182
Hispanics [§]	24,961	74	88
Whites	1,288,411	139	121
All Men	1,393,321	141	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

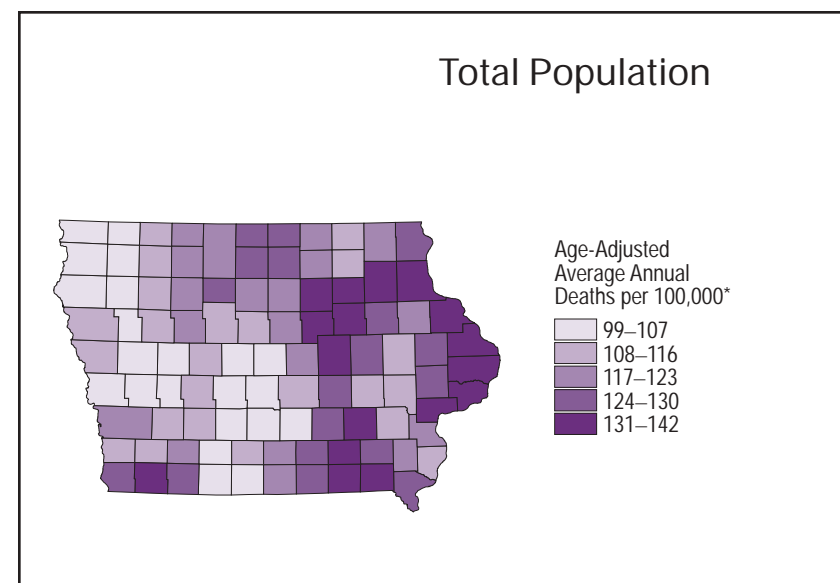
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Iowa

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,869	‡	79
Asians and Pacific Islanders	10,741	103	105
Blacks	20,539	162	166
Hispanics [§]	16,550	61	79
Whites	1,463,128	118	117
Total Population	1,497,277	119	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,503	‡	77
Asians and Pacific Islanders	5,807	‡	96
Blacks	10,490	128	153
Hispanics [§]	8,168	54	72
Whites	778,166	113	113
All Women	795,966	113	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,366	‡	80
Asians and Pacific Islanders	4,934	‡	118
Blacks	10,049	212	182
Hispanics [§]	8,382	‡	88
Whites	684,962	124	121
All Men	701,311	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

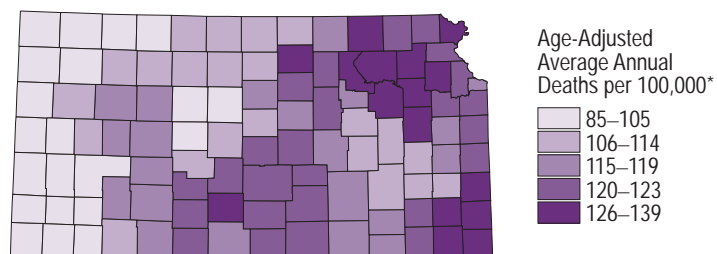
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,279	90	79
Asians and Pacific Islanders	16,019	88	105
Blacks	61,399	183	166
Hispanics [§]	43,299	79	79
Whites	1,242,261	118	117
Total Population	1,328,958	120	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,859	72	77
Asians and Pacific Islanders	9,023	84	96
Blacks	32,410	174	153
Hispanics [§]	21,181	70	72
Whites	653,848	114	113
All Women	700,140	116	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,420	109	80
Asians and Pacific Islanders	6,996	[‡]	118
Blacks	28,989	197	182
Hispanics [§]	22,118	88	88
Whites	588,413	122	121
All Men	628,818	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

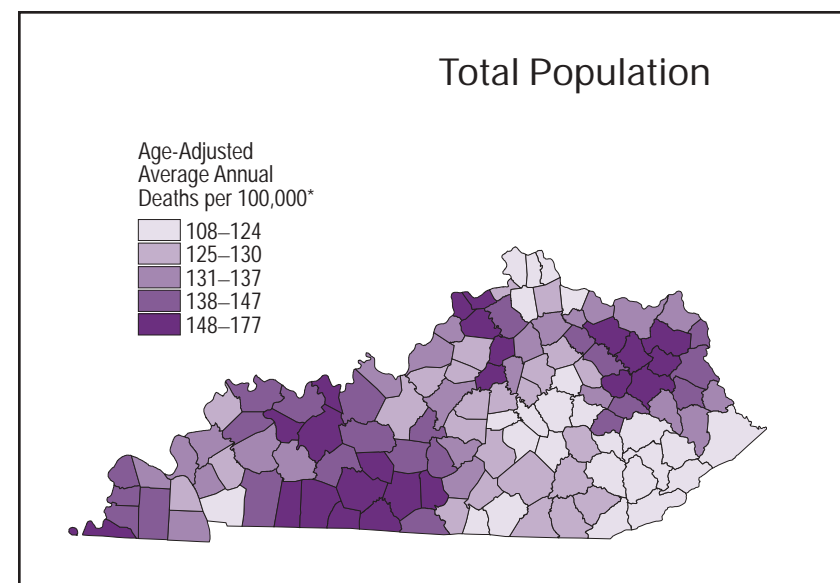
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Kentucky

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,763	‡	79
Asians and Pacific Islanders	10,449	87	105
Blacks	122,041	165	166
Hispanics [§]	10,712	87	79
Whites	1,874,871	132	117
Total Population	2,010,124	133	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,419	‡	77
Asians and Pacific Islanders	5,721	‡	96
Blacks	68,439	158	153
Hispanics [§]	5,498	91	72
Whites	996,724	127	113
All Women	1,072,303	128	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,344	‡	80
Asians and Pacific Islanders	4,728	‡	118
Blacks	53,602	172	182
Hispanics [§]	5,214	‡	88
Whites	878,147	138	121
All Men	937,821	140	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

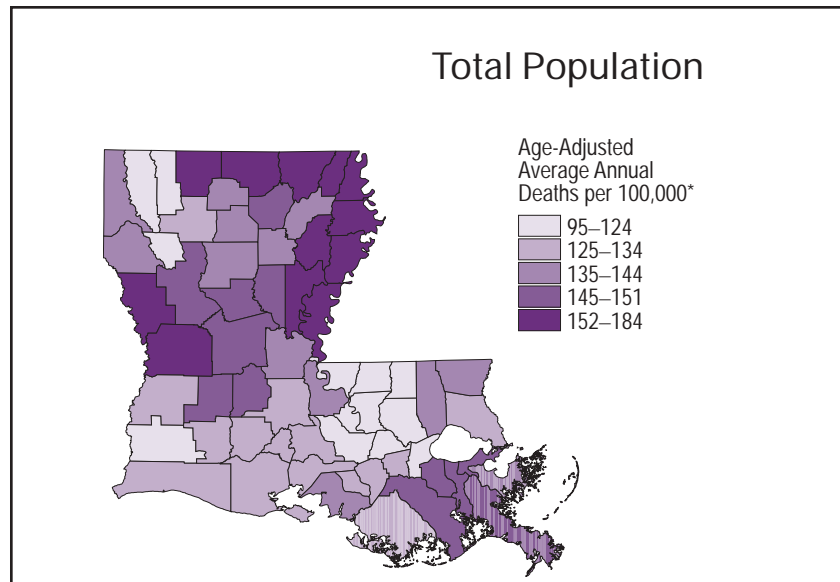
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,958	79	79
Asians and Pacific Islanders	21,132	88	105
Blacks	564,526	172	166
Hispanics [§]	50,792	55	79
Whites	1,510,022	121	117
Total Population	2,103,638	133	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,009	‡	77
Asians and Pacific Islanders	11,206	82	96
Blacks	320,128	155	153
Hispanics [§]	26,611	45	72
Whites	797,703	116	113
All Women	1,133,046	126	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,949	‡	80
Asians and Pacific Islanders	9,926	95	118
Blacks	244,398	197	182
Hispanics [§]	24,181	72	88
Whites	712,319	128	121
All Men	970,592	143	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

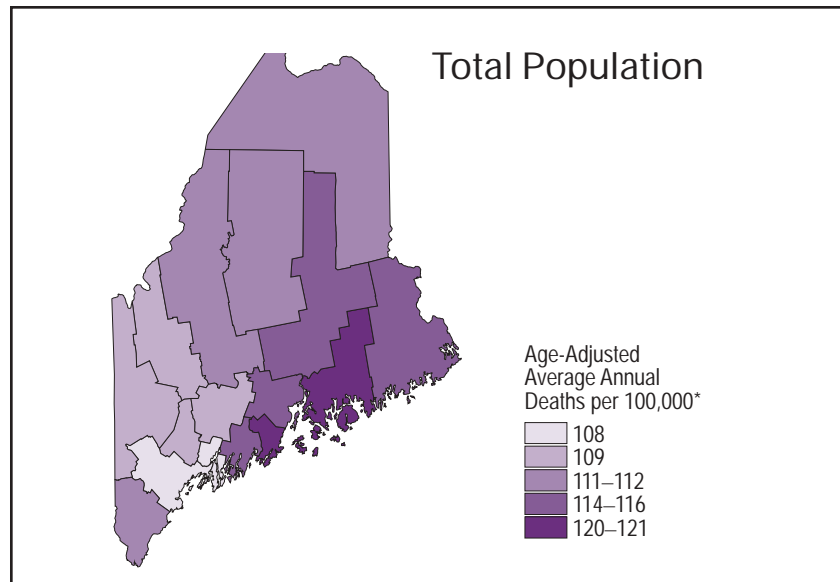
§Includes data for Hispanics in all racial groups.

Members of an employee bowling league
enjoy an outing in Atlanta, Georgia.



Greg Knobloch/CDC

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,306	‡	79
Asians and Pacific Islanders	3,475	‡	105
Blacks	2,083	‡	166
Hispanics [§]	3,116	‡	79
Whites	667,805	111	117
Total Population	675,669	111	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,150	‡	77
Asians and Pacific Islanders	1,984	‡	96
Blacks	896	‡	153
Hispanics [§]	1,646	‡	72
Whites	351,557	105	113
All Women	355,587	105	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,156	‡	80
Asians and Pacific Islanders	1,491	‡	118
Blacks	1,187	‡	182
Hispanics [§]	1,470	‡	88
Whites	316,248	119	121
All Men	320,082	119	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

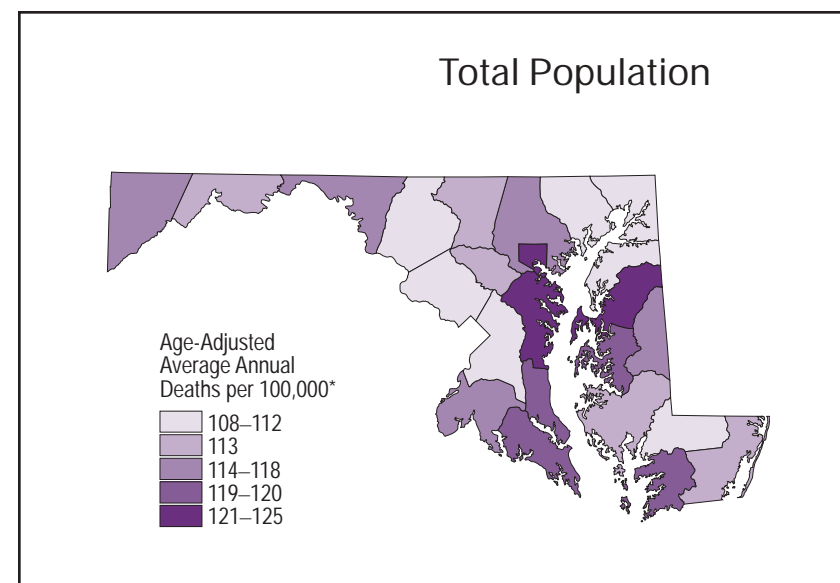
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Maryland

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,082	70	79
Asians and Pacific Islanders	92,238	92	105
Blacks	632,523	145	166
Hispanics [§]	71,398	22	79
Whites	1,884,306	110	117
Total Population	2,616,149	117	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,606	‡	77
Asians and Pacific Islanders	49,347	94	96
Blacks	350,491	134	153
Hispanics [§]	37,603	23	72
Whites	984,813	106	113
All Women	1,388,257	112	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,476	‡	80
Asians and Pacific Islanders	42,891	90	118
Blacks	282,032	159	182
Hispanics [§]	33,795	22	88
Whites	899,493	113	121
All Men	1,227,892	122	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

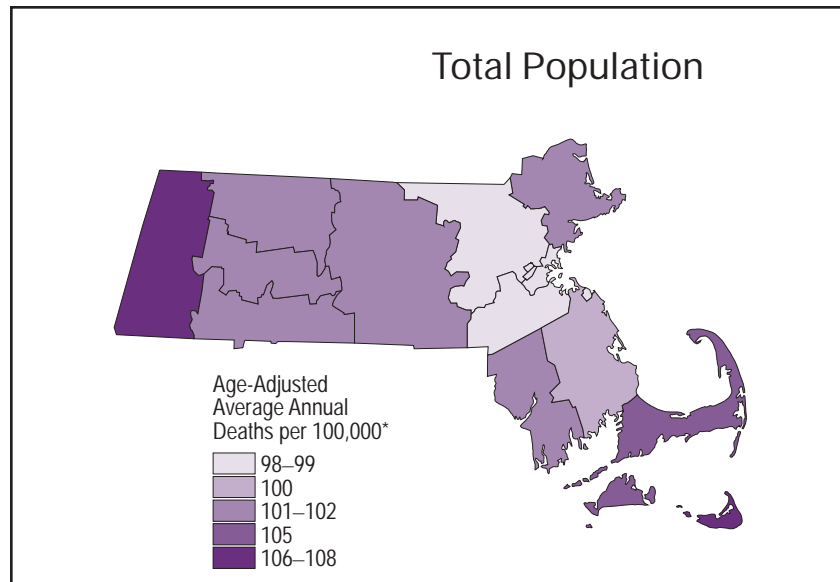
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,101	‡	79
Asians and Pacific Islanders	78,066	87	105
Blacks	145,793	125	166
Hispanics [§]	117,093	51	79
Whites	2,974,102	99	117
Total Population	3,204,062	100	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,199	‡	77
Asians and Pacific Islanders	40,702	82	96
Blacks	78,707	121	153
Hispanics [§]	62,141	45	72
Whites	1,601,110	96	113
All Women	1,723,718	97	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,902	‡	80
Asians and Pacific Islanders	37,364	96	118
Blacks	67,086	124	182
Hispanics [§]	54,952	59	88
Whites	1,372,992	101	121
All Men	1,480,344	102	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

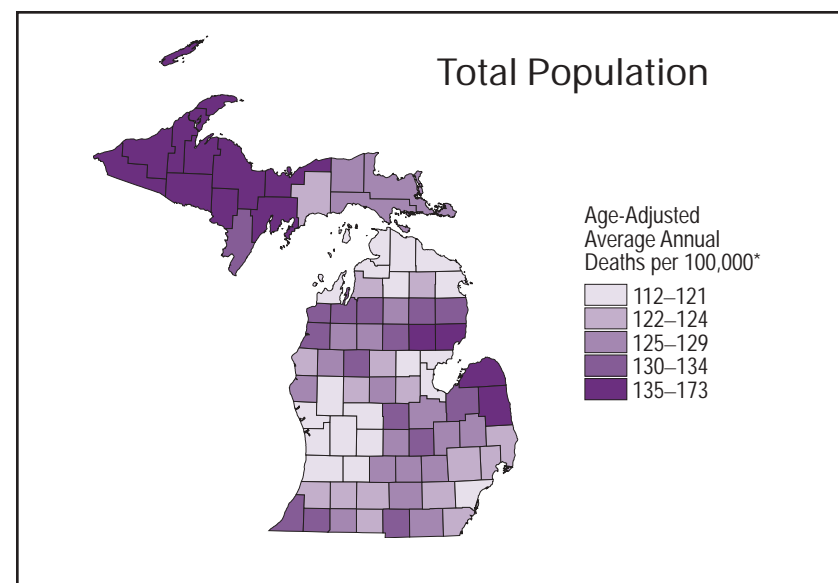
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Michigan

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	23,903	160	79
Asians and Pacific Islanders	60,889	91	105
Blacks	594,774	151	166
Hispanics [§]	89,839	79	79
Whites	4,275,967	121	117
Total Population	4,955,533	124	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	12,534	181	77
Asians and Pacific Islanders	32,163	86	96
Blacks	333,768	141	153
Hispanics [§]	45,399	68	72
Whites	2,246,945	117	113
All Women	2,625,410	120	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	11,369	124	80
Asians and Pacific Islanders	28,726	97	118
Blacks	261,006	162	182
Hispanics [§]	44,440	95	88
Whites	2,029,022	125	121
All Men	2,330,123	129	126

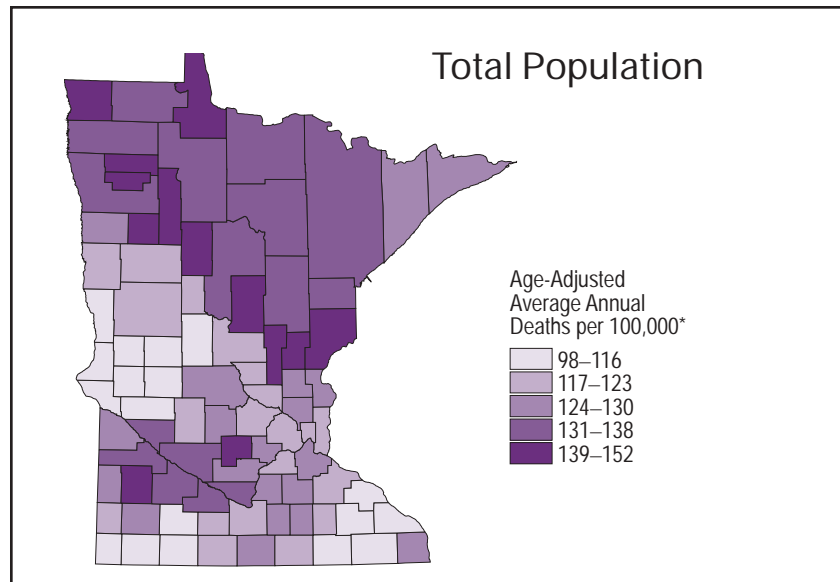
*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,298	102	79
Asians and Pacific Islanders	34,210	141	105
Blacks	45,784	158	166
Hispanics [§]	25,751	81	79
Whites	2,279,044	124	117
Total Population	2,377,336	125	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,603	97	77
Asians and Pacific Islanders	18,167	132	96
Blacks	22,050	155	153
Hispanics [§]	12,633	65	72
Whites	1,190,024	117	113
All Women	1,239,844	118	117

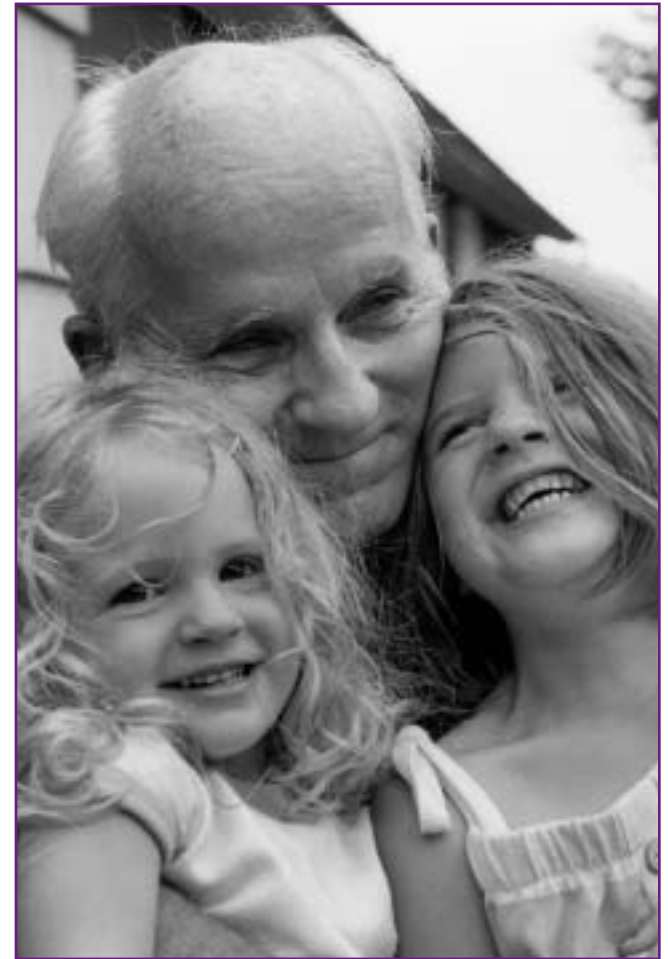
Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,695	109	80
Asians and Pacific Islanders	16,043	154	118
Blacks	23,734	157	182
Hispanics [§]	13,118	107	88
Whites	1,089,020	131	121
All Men	1,137,492	132	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

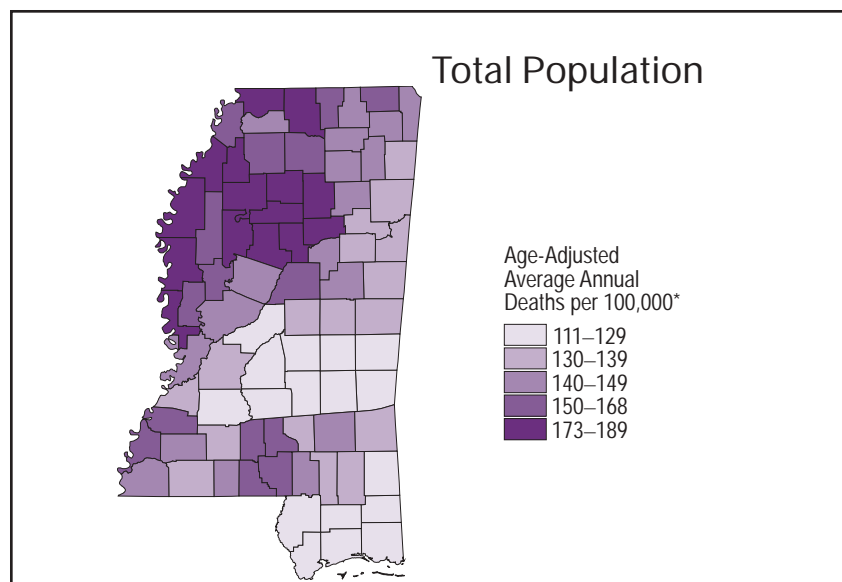
[§]Includes data for Hispanics in all racial groups.



A New York man hugs his granddaughters.

© Rick Reinhard

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,495	139	79
Asians and Pacific Islanders	6,827	91	105
Blacks	388,462	183	166
Hispanics [§]	8,337	†	79
Whites	915,397	125	117
Total Population	1,314,181	140	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,853	†	77
Asians and Pacific Islanders	3,890	†	96
Blacks	220,343	162	153
Hispanics [§]	4,350	†	72
Whites	487,332	118	113
All Women	713,418	130	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,642	†	80
Asians and Pacific Islanders	2,937	†	118
Blacks	168,119	212	182
Hispanics [§]	3,987	†	88
Whites	428,065	134	121
All Men	600,763	153	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

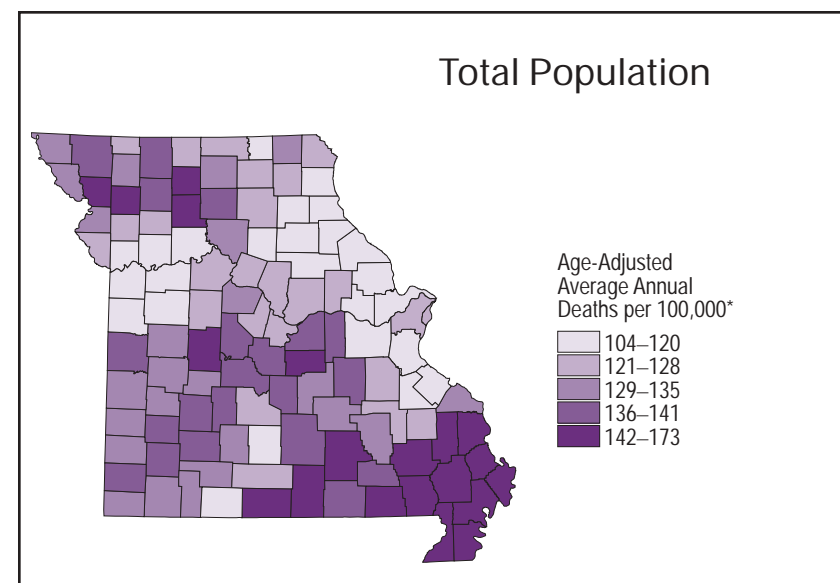
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Missouri

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,418	32	79
Asians and Pacific Islanders	22,700	115	105
Blacks	251,814	156	166
Hispanics [§]	30,845	82	79
Whites	2,505,179	124	117
Total Population	2,789,111	127	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,874	‡	77
Asians and Pacific Islanders	12,427	114	96
Blacks	143,196	139	153
Hispanics [§]	15,904	84	72
Whites	1,332,903	120	113
All Women	1,493,400	122	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,544	‡	80
Asians and Pacific Islanders	10,273	116	118
Blacks	108,618	180	182
Hispanics [§]	14,941	76	88
Whites	1,172,276	130	121
All Men	1,295,711	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

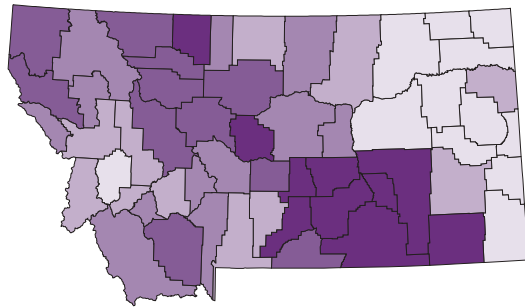
standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Age-Adjusted
Average Annual
Deaths per 100,000*

90–111
112–118
119–126
129–135
136–144

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,010	149	79
Asians and Pacific Islanders	1,769	†	105
Blacks	966	†	166
Hispanics [§]	5,704	108	79
Whites	449,085	123	117
Total Population	469,830	124	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,506	145	77
Asians and Pacific Islanders	1,102	†	96
Blacks	415	†	153
Hispanics [§]	2,896	†	72
Whites	229,755	120	113
All Women	240,778	122	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,504	152	80
Asians and Pacific Islanders	667	†	118
Blacks	551	†	182
Hispanics [§]	2,808	†	88
Whites	219,330	124	121
All Men	229,052	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

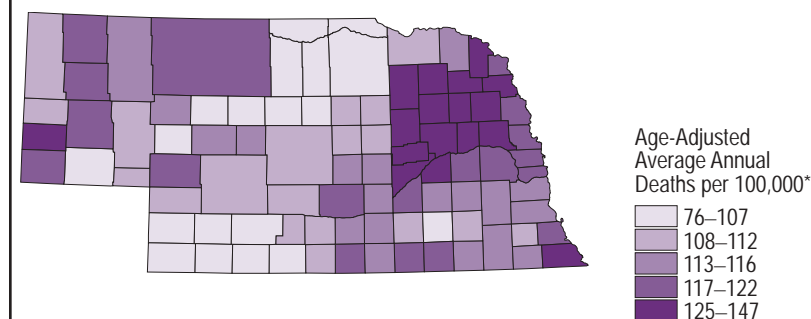
Stroke Death Rates, 1991–1998

Nebraska

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,448	169	79
Asians and Pacific Islanders	6,646	†	105
Blacks	24,917	176	166
Hispanics [§]	21,033	51	79
Whites	802,211	116	117
Total Population	838,222	117	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,416	†	77
Asians and Pacific Islanders	3,712	†	96
Blacks	13,436	157	153
Hispanics [§]	10,388	†	72
Whites	423,009	109	113
All Women	442,573	110	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,032	296	80
Asians and Pacific Islanders	2,934	†	118
Blacks	11,481	203	182
Hispanics [§]	10,645	68	88
Whites	379,202	125	121
All Men	395,649	127	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

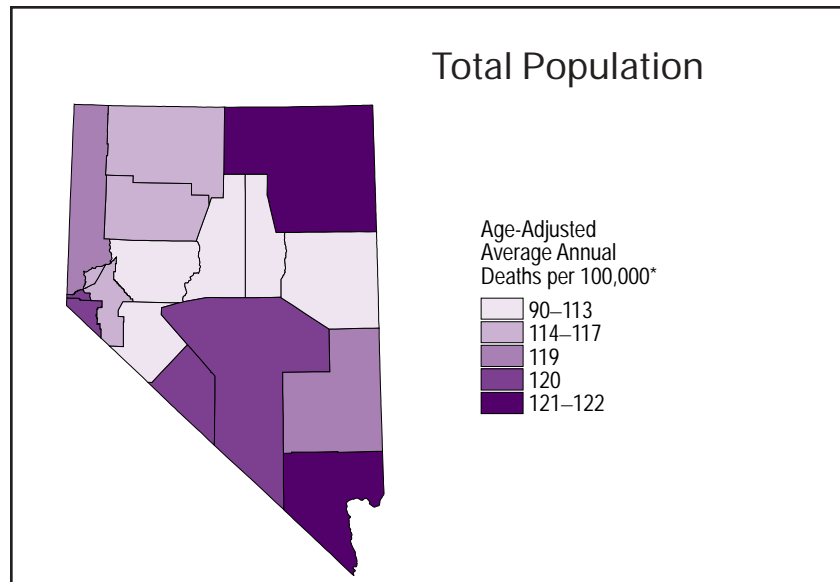
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	13,110	51	79
Asians and Pacific Islanders	36,169	112	105
Blacks	54,073	154	166
Hispanics [§]	90,437	49	79
Whites	773,114	117	117
Total Population	876,466	118	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,696	‡	77
Asians and Pacific Islanders	20,426	94	96
Blacks	27,654	148	153
Hispanics [§]	44,174	46	72
Whites	380,556	115	113
All Women	435,332	115	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,414	‡	80
Asians and Pacific Islanders	15,743	134	118
Blacks	26,419	156	182
Hispanics [§]	46,263	50	88
Whites	392,558	118	121
All Men	441,134	119	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

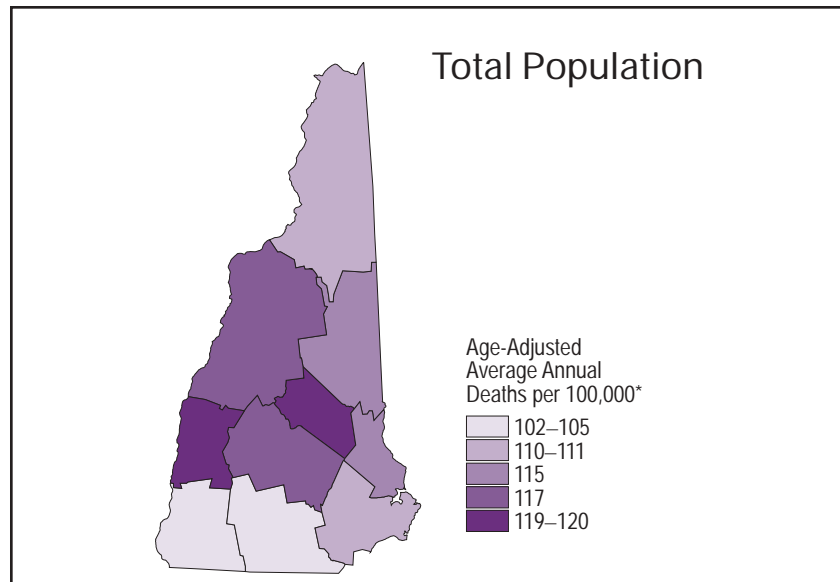
[§]Includes data for Hispanics in all racial groups.

Senior citizens dance in Seattle, Washington.



© Jim West

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	987	‡	79
Asians and Pacific Islanders	5,394	‡	105
Blacks	3,311	‡	166
Hispanics [§]	6,047	‡	79
Whites	598,831	118	117
Total Population	608,523	118	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	514	‡	77
Asians and Pacific Islanders	2,901	‡	96
Blacks	1,440	‡	153
Hispanics [§]	3,045	‡	72
Whites	310,929	116	113
All Women	315,784	116	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	473	‡	80
Asians and Pacific Islanders	2,493	‡	118
Blacks	1,871	‡	182
Hispanics [§]	3,002	‡	88
Whites	287,902	117	121
All Men	292,739	117	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

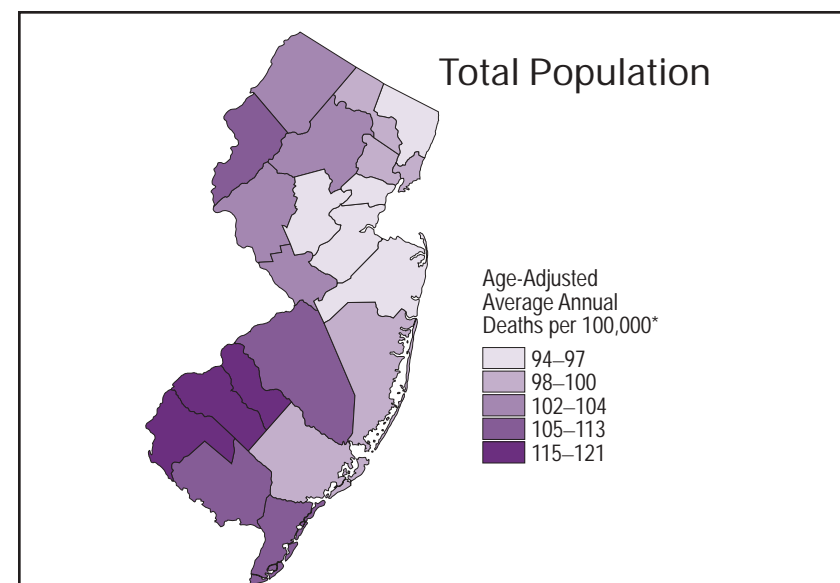
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

New Jersey

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,626	53	79
Asians and Pacific Islanders	204,817	59	105
Blacks	516,221	141	166
Hispanics [§]	404,607	54	79
Whites	3,563,224	97	117
Total Population	4,293,888	101	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,019	‡	77
Asians and Pacific Islanders	107,664	58	96
Blacks	287,779	135	153
Hispanics [§]	212,915	49	72
Whites	1,896,965	92	113
All Women	2,297,427	96	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,607	‡	80
Asians and Pacific Islanders	97,153	59	118
Blacks	228,442	147	182
Hispanics [§]	191,692	61	88
Whites	1,666,259	102	121
All Men	1,996,461	106	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

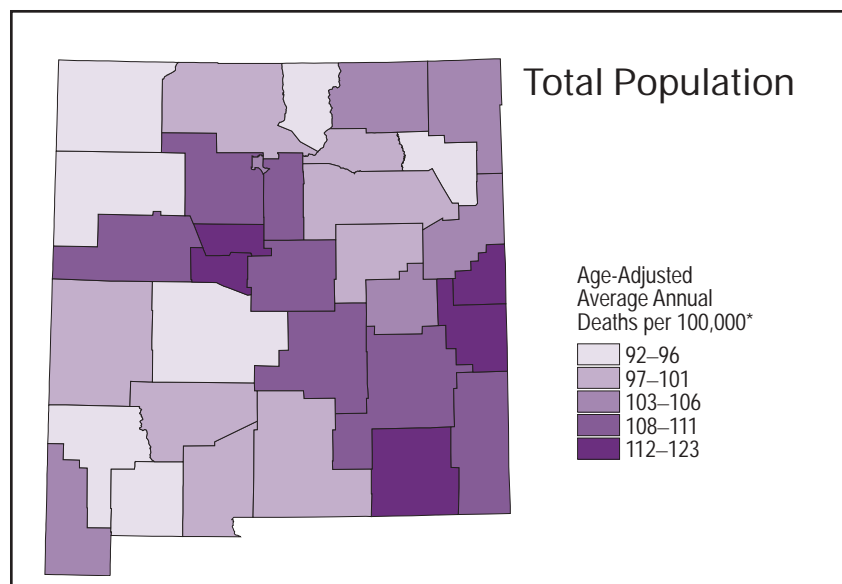
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	54,153	85	79
Asians and Pacific Islanders	9,922	108	105
Blacks	18,877	107	166
Hispanics [§]	285,305	106	79
Whites	760,509	106	117
Total Population	843,461	105	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	29,592	75	77
Asians and Pacific Islanders	5,750	†	96
Blacks	9,302	107	153
Hispanics [§]	147,733	101	72
Whites	395,350	106	113
All Women	439,994	105	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	24,561	100	80
Asians and Pacific Islanders	4,172	†	118
Blacks	9,575	104	182
Hispanics [§]	137,572	111	88
Whites	365,159	104	121
All Men	403,467	104	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

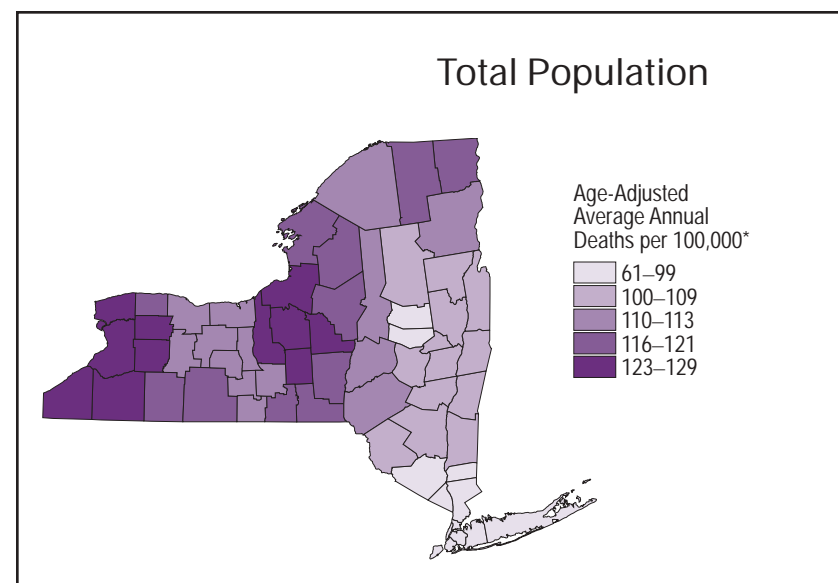
†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

New York

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	32,679	48	79
Asians and Pacific Islanders	453,493	59	105
Blacks	1,423,231	95	166
Hispanics [§]	1,043,844	54	79
Whites	7,478,532	87	117
Total Population	9,387,935	89	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	17,253	44	77
Asians and Pacific Islanders	234,222	57	96
Blacks	813,464	90	153
Hispanics [§]	573,202	49	72
Whites	4,006,724	84	113
All Women	5,071,663	85	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,426	54	80
Asians and Pacific Islanders	219,271	60	118
Blacks	609,767	101	182
Hispanics [§]	470,642	61	88
Whites	3,471,808	90	121
All Men	4,316,272	91	126

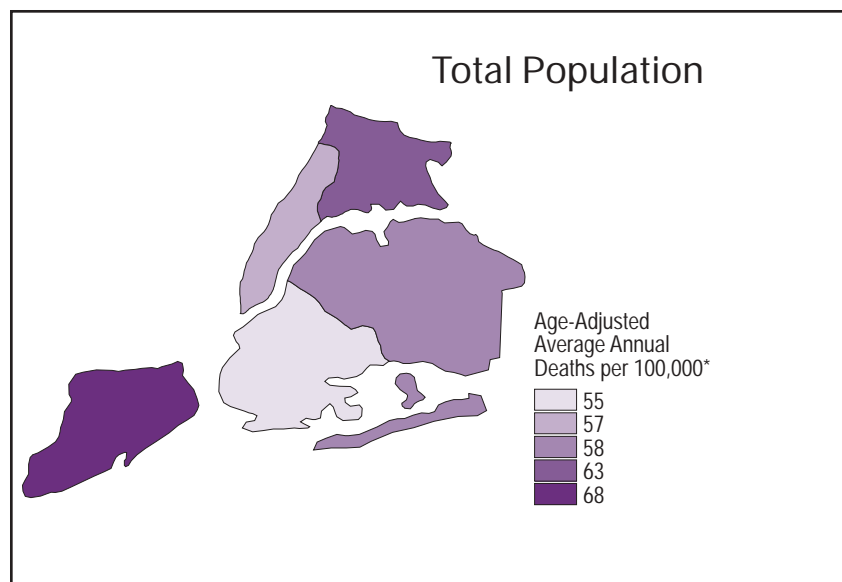
*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	14,894	‡	79
Asians and Pacific Islanders	337,658	61	105
Blacks	1,059,935	85	166
Hispanics [§]	839,003	54	79
Whites	2,338,518	56	117
Total Population	3,751,005	63	121

Women			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,996	‡	77
Asians and Pacific Islanders	172,939	57	96
Blacks	618,540	81	153
Hispanics [§]	470,513	49	72
Whites	1,280,216	53	113
All Women	2,079,691	60	117

Men			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,898	‡	80
Asians and Pacific Islanders	164,719	65	118
Blacks	441,395	90	182
Hispanics [§]	368,520	59	88
Whites	1,058,302	59	121
All Men	1,671,314	66	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

New York City

During 1991–1993, information on Hispanic origin was not reported on an average 18% of stroke death certificates for adults ages 35 years and older residing in New York City. During 1994–1998, the percentage of death certificates missing this information decreased to <3%. After examining New York City death certificate data for 1991–1998, we concluded that most deaths with “unknown” Hispanic origin occurred among non-Hispanic adults. Our calculations indicated that the percentage of stroke deaths among Hispanic adults increased slightly from 1991–1993 to 1994–1998, whereas the percentage of stroke deaths for non-Hispanic adults increased markedly after reporting improved in 1994.

However, because a proportion of the deaths with missing Hispanic origin data occurred among Hispanic adults, the stroke death rates reported here for Hispanic adults are likely underestimated. Erroneous reporting of Hispanics as whites on death certificates also causes rates to be underestimated for Hispanics (see Section 1). The extent of underestimation may have varied among the five city boroughs, so readers should be prudent when comparing county rates.

Distribution of Stroke Deaths by Hispanic Origin Among Persons Ages ≥ 35 Years, New York City

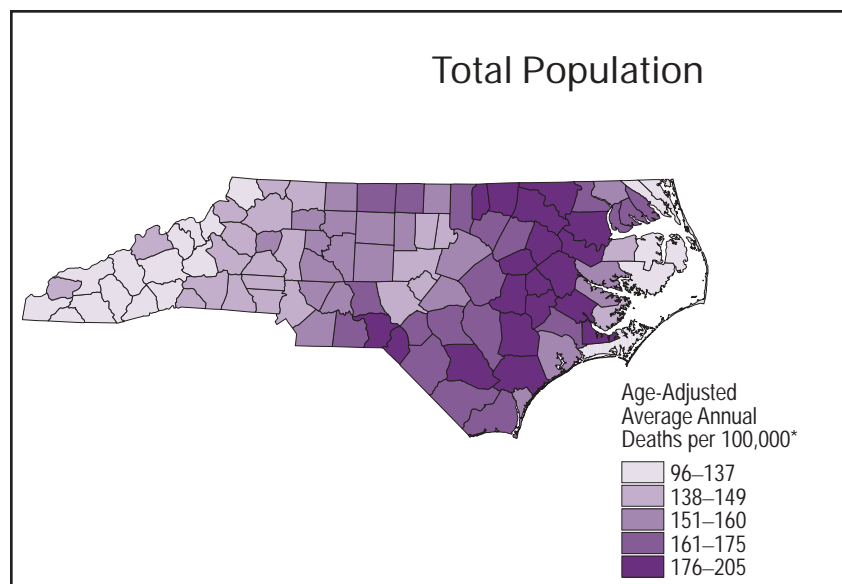
Year	Hispanic Origin		
	Non-Hispanic	Hispanic	Unknown
1991	73.8%	9.9%	16.4%
1992	69.3%	11.7%	19.0%
1993	69.0%	11.4%	19.6%
1994	84.6%	13.2%	2.3%
1995	83.3%	15.2%	1.5%
1996	82.6%	15.9%	1.6%
1997	83.9%	14.2%	1.9%
1998	82.4%	15.9%	1.8%

A carpenter works on the new International Brotherhood of Carpenters headquarters in the District of Columbia.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	37,358	145	79
Asians and Pacific Islanders	36,477	75	105
Blacks	712,268	210	166
Hispanics [§]	44,009	26	79
Whites	3,016,773	143	117
Total Population	3,802,876	155	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	19,729	133	77
Asians and Pacific Islanders	20,259	86	96
Blacks	401,959	190	153
Hispanics [§]	21,230	25	72
Whites	1,601,323	136	113
All Women	2,043,270	145	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	17,629	162	80
Asians and Pacific Islanders	16,218	59	118
Blacks	310,309	239	182
Hispanics [§]	22,779	[‡]	88
Whites	1,415,450	152	121
All Men	1,759,606	166	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

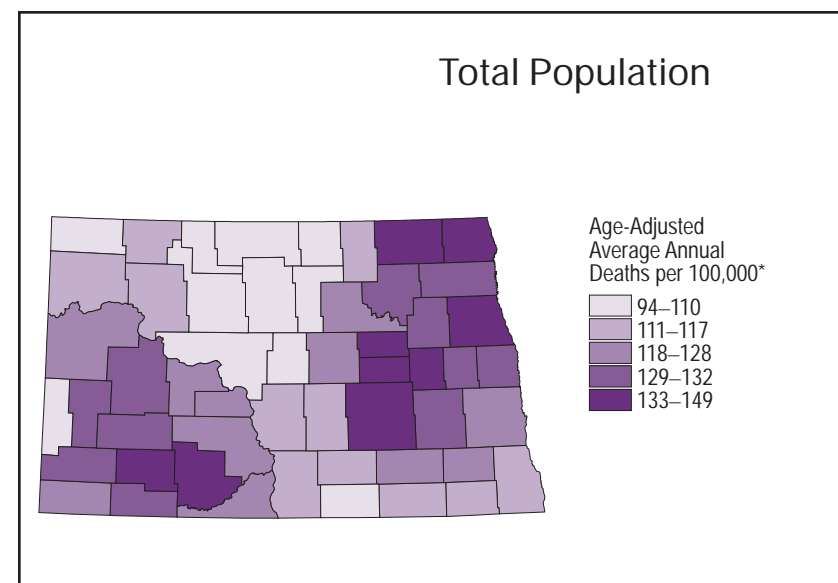
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

North Dakota

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,301	141	79
Asians and Pacific Islanders	1,589	†	105
Blacks	972	†	166
Hispanics [§]	1,628	†	79
Whites	315,511	121	117
Total Population	326,373	122	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,583	134	77
Asians and Pacific Islanders	897	†	96
Blacks	426	†	153
Hispanics [§]	839	†	72
Whites	163,153	111	113
All Women	169,059	111	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,718	153	80
Asians and Pacific Islanders	692	†	118
Blacks	546	†	182
Hispanics [§]	789	†	88
Whites	152,358	135	121
All Men	157,314	136	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

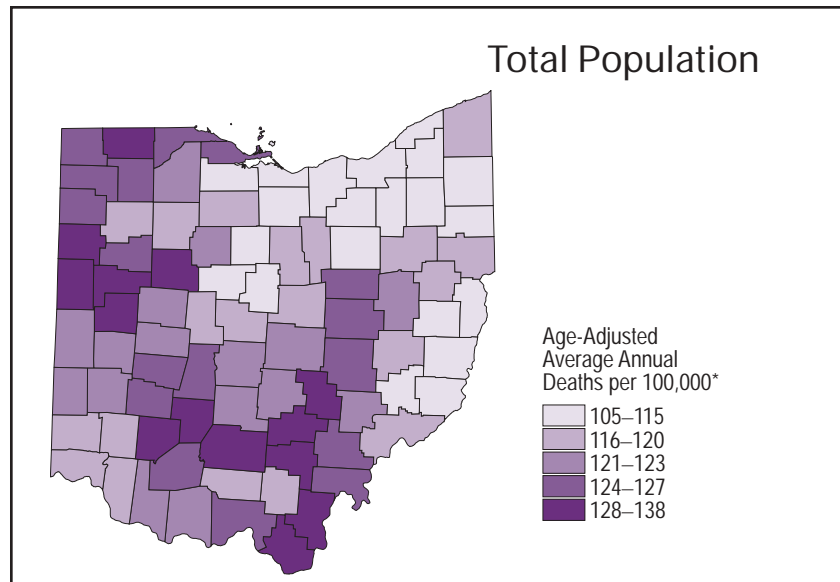
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	10,784	‡	79
Asians and Pacific Islanders	52,750	69	105
Blacks	553,737	146	166
Hispanics [§]	63,933	58	79
Whites	5,150,152	115	117
Total Population	5,767,423	117	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,562	‡	77
Asians and Pacific Islanders	28,263	63	96
Blacks	310,818	135	153
Hispanics [§]	33,114	55	72
Whites	2,744,441	110	113
All Women	3,089,084	112	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,222	‡	80
Asians and Pacific Islanders	24,487	78	118
Blacks	242,919	161	182
Hispanics [§]	30,819	62	88
Whites	2,405,711	120	121
All Men	2,678,339	123	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

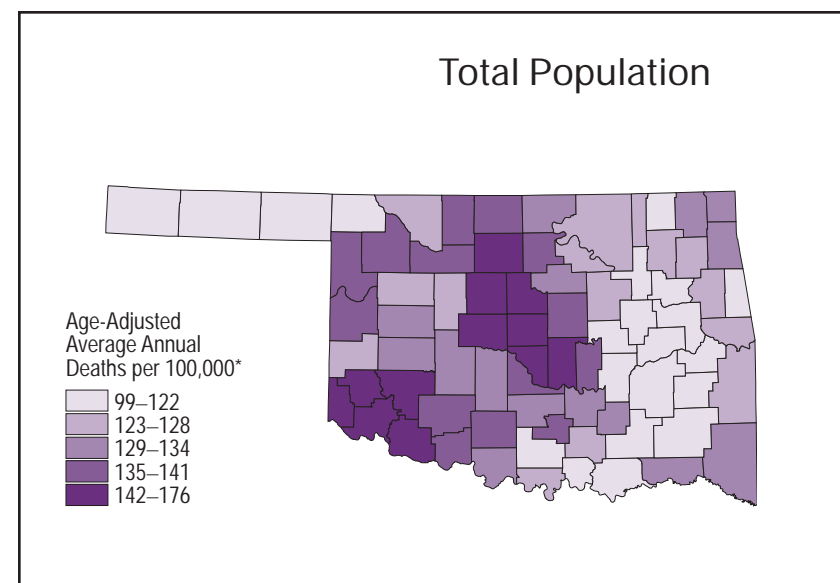
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Oklahoma

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	102,535	67	79
Asians and Pacific Islanders	16,925	124	105
Blacks	103,268	165	166
Hispanics [§]	39,600	18	79
Whites	1,472,070	133	117
Total Population	1,694,798	131	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	55,676	64	77
Asians and Pacific Islanders	9,632	126	96
Blacks	56,281	155	153
Hispanics [§]	19,644	†	72
Whites	780,337	131	113
All Women	901,926	128	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	46,859	69	80
Asians and Pacific Islanders	7,293	120	118
Blacks	46,987	178	182
Hispanics [§]	19,956	†	88
Whites	691,733	135	121
All Men	792,872	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

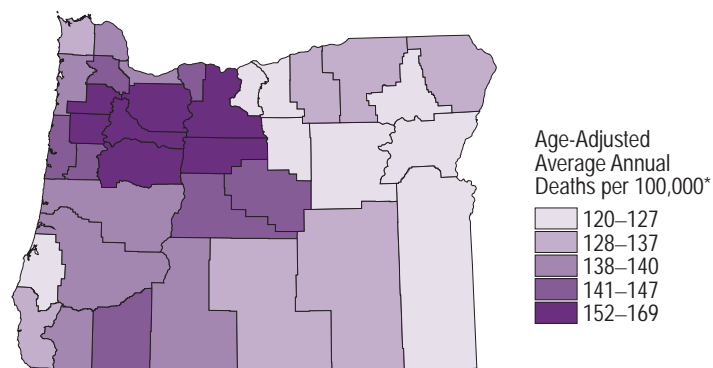
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,380	111	79
Asians and Pacific Islanders	41,042	129	105
Blacks	23,839	209	166
Hispanics [§]	57,711	75	79
Whites	1,644,771	145	117
Total Population	1,728,032	146	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,573	113	77
Asians and Pacific Islanders	22,467	145	96
Blacks	11,420	195	153
Hispanics [§]	27,365	68	72
Whites	854,890	143	113
All Women	898,350	144	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,807	105	80
Asians and Pacific Islanders	18,575	110	118
Blacks	12,419	225	182
Hispanics [§]	30,346	83	88
Whites	789,881	146	121
All Men	829,682	146	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

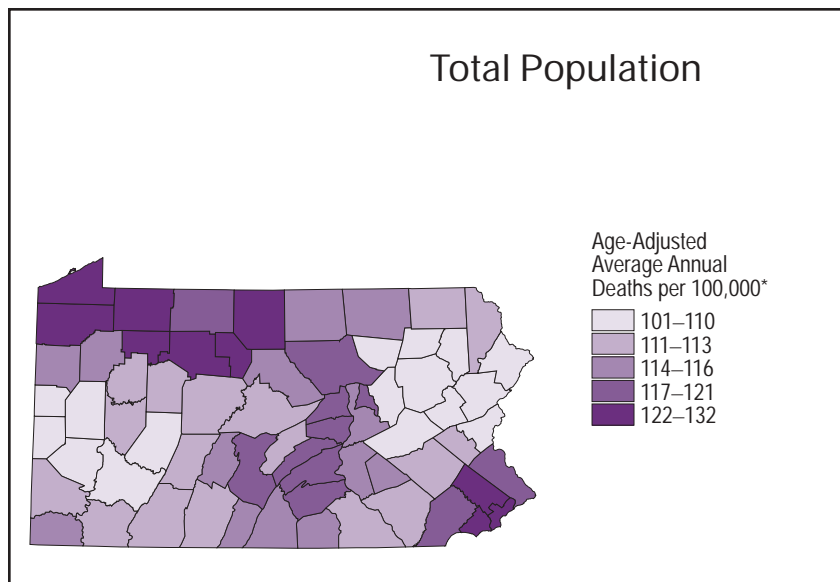
[§]Includes data for Hispanics in all racial groups.

A high school principal attends a rally to support immigrants' rights and Latino voter registration in the District of Columbia.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,873	40	79
Asians and Pacific Islanders	79,509	86	105
Blacks	515,730	149	166
Hispanics [§]	106,240	89	79
Whites	5,899,121	113	117
Total Population	6,502,233	116	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,040	‡	77
Asians and Pacific Islanders	42,476	86	96
Blacks	292,502	139	153
Hispanics [§]	55,247	80	72
Whites	3,169,892	109	113
All Women	3,508,910	111	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,833	‡	80
Asians and Pacific Islanders	37,033	85	118
Blacks	223,228	161	182
Hispanics [§]	50,993	100	88
Whites	2,729,229	118	121
All Men	2,993,323	121	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

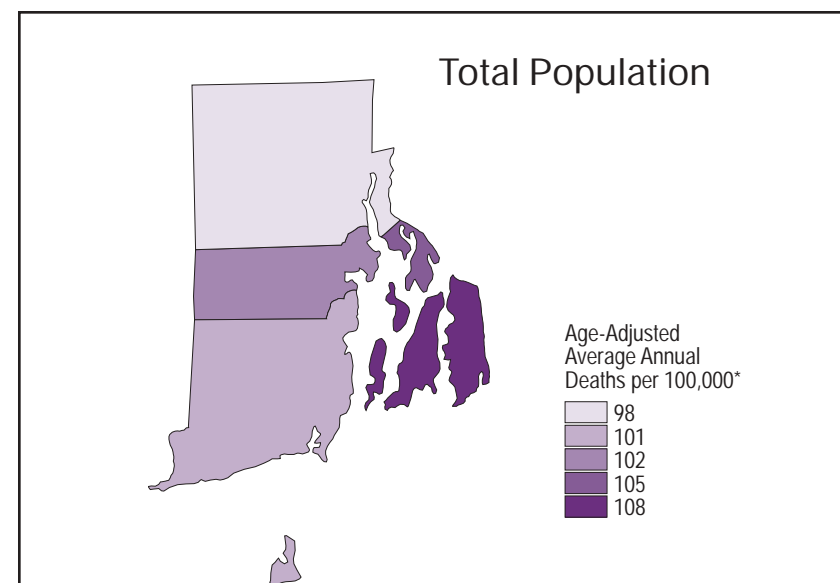
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Rhode Island

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,770	‡	79
Asians and Pacific Islanders	7,850	98	105
Blacks	18,251	157	166
Hispanics [§]	21,264	37	79
Whites	489,482	102	117
Total Population	517,353	103	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	967	‡	77
Asians and Pacific Islanders	4,131	‡	96
Blacks	9,661	161	153
Hispanics [§]	11,238	42	72
Whites	265,599	98	113
All Women	280,358	99	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	803	‡	80
Asians and Pacific Islanders	3,719	‡	118
Blacks	8,590	144	182
Hispanics [§]	10,026	‡	88
Whites	223,883	104	121
All Men	236,995	105	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

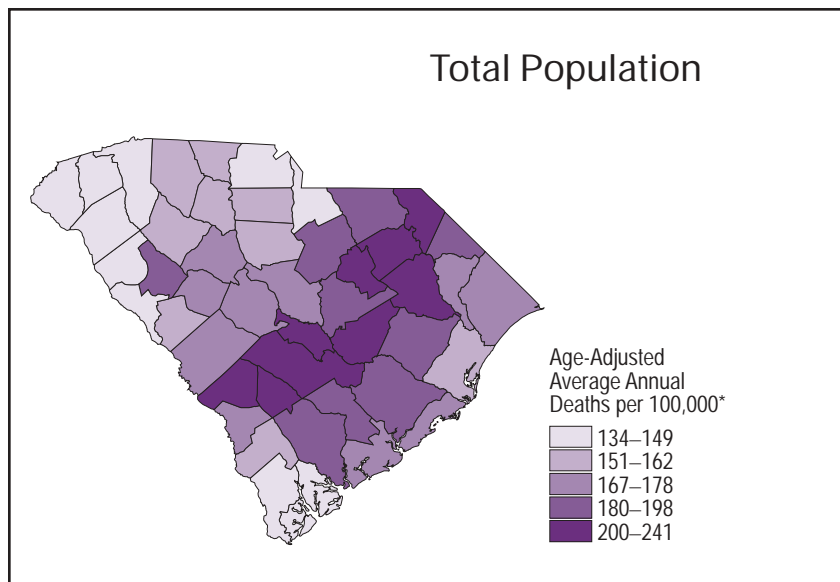
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,744	‡	79
Asians and Pacific Islanders	13,733	61	105
Blacks	489,945	237	166
Hispanics [§]	16,669	‡	79
Whites	1,424,035	149	117
Total Population	1,931,457	169	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,946	‡	77
Asians and Pacific Islanders	7,920	‡	96
Blacks	275,747	209	153
Hispanics [§]	8,557	‡	72
Whites	750,892	144	113
All Women	1,036,505	159	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,798	‡	80
Asians and Pacific Islanders	5,813	‡	118
Blacks	214,198	277	182
Hispanics [§]	8,112	‡	88
Whites	673,143	152	121
All Men	894,952	178	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

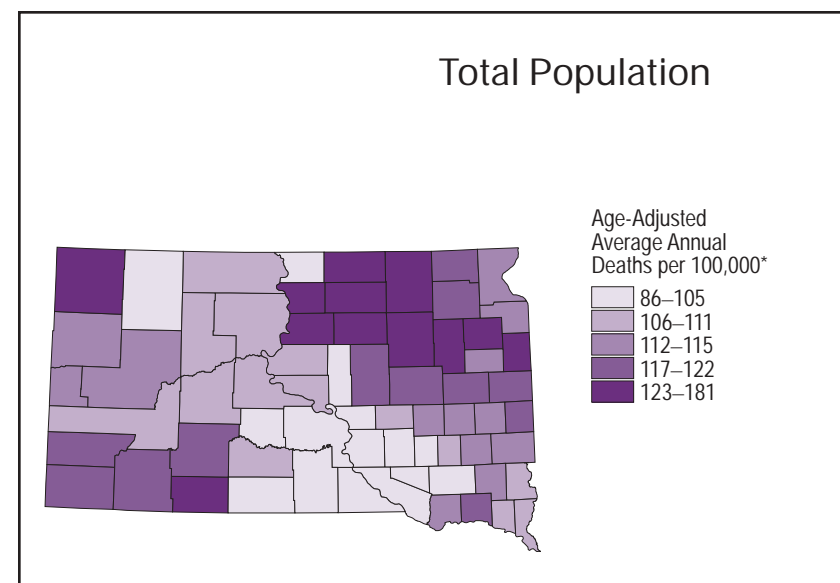
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

South Dakota

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,025	165	79
Asians and Pacific Islanders	1,387	†	105
Blacks	1,378	†	166
Hispanics [§]	2,423	†	79
Whites	348,904	115	117
Total Population	366,694	116	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,173	139	77
Asians and Pacific Islanders	864	†	96
Blacks	482	†	153
Hispanics [§]	1,206	†	72
Whites	181,889	107	113
All Women	191,408	108	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,852	198	80
Asians and Pacific Islanders	523	†	118
Blacks	896	†	182
Hispanics [§]	1,217	†	88
Whites	167,015	125	121
All Men	175,286	127	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

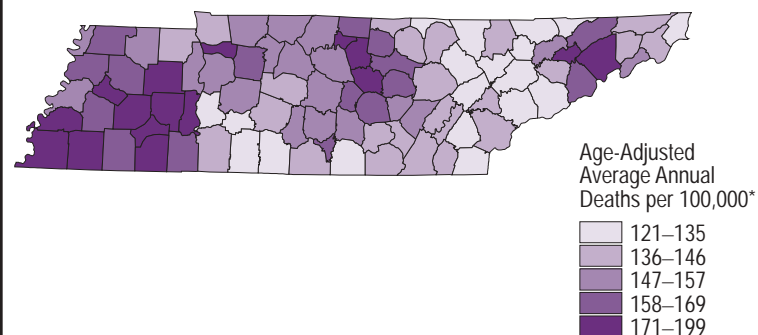
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,560	‡	79
Asians and Pacific Islanders	21,015	107	105
Blacks	372,168	220	166
Hispanics [§]	20,731	85	79
Whites	2,396,499	148	117
Total Population	2,795,242	156	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,854	‡	77
Asians and Pacific Islanders	11,525	98	96
Blacks	212,016	198	153
Hispanics [§]	10,352	67	72
Whites	1,273,535	143	113
All Women	1,499,930	149	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,706	‡	80
Asians and Pacific Islanders	9,490	121	118
Blacks	160,152	254	182
Hispanics [§]	10,379	113	88
Whites	1,122,964	154	121
All Men	1,295,312	165	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

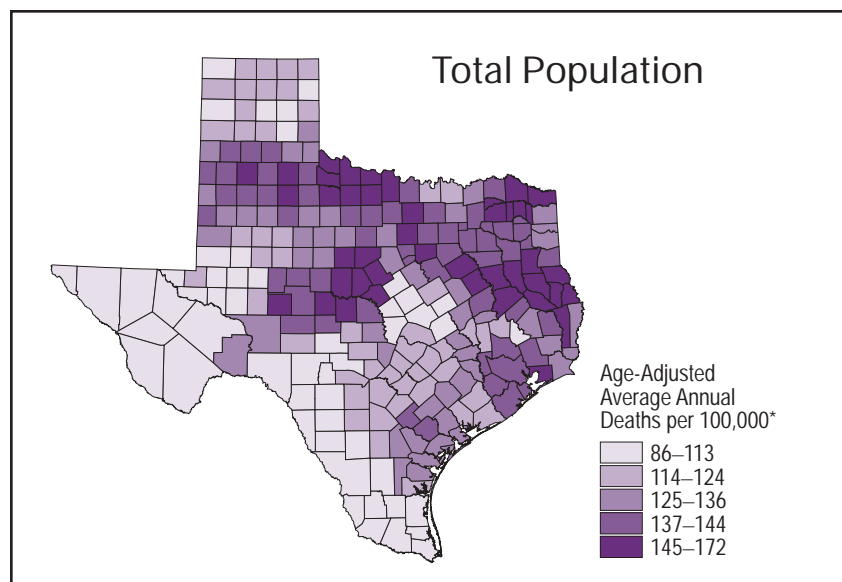
[§]Includes data for Hispanics in all racial groups.

A woman participates in one of the musical activities held weekly at a city-run senior center in Albuquerque, New Mexico.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	41,732	13	79
Asians and Pacific Islanders	229,438	80	105
Blacks	999,293	182	166
Hispanics [§]	2,033,336	100	79
Whites	7,935,437	126	117
Total Population	9,205,900	130	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	21,003	‡	77
Asians and Pacific Islanders	122,232	78	96
Blacks	541,658	170	153
Hispanics [§]	1,055,918	89	72
Whites	4,144,947	122	113
All Women	4,829,840	126	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	20,729	‡	80
Asians and Pacific Islanders	107,206	82	118
Blacks	457,635	199	182
Hispanics [§]	977,418	113	88
Whites	3,790,490	128	121
All Men	4,376,060	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

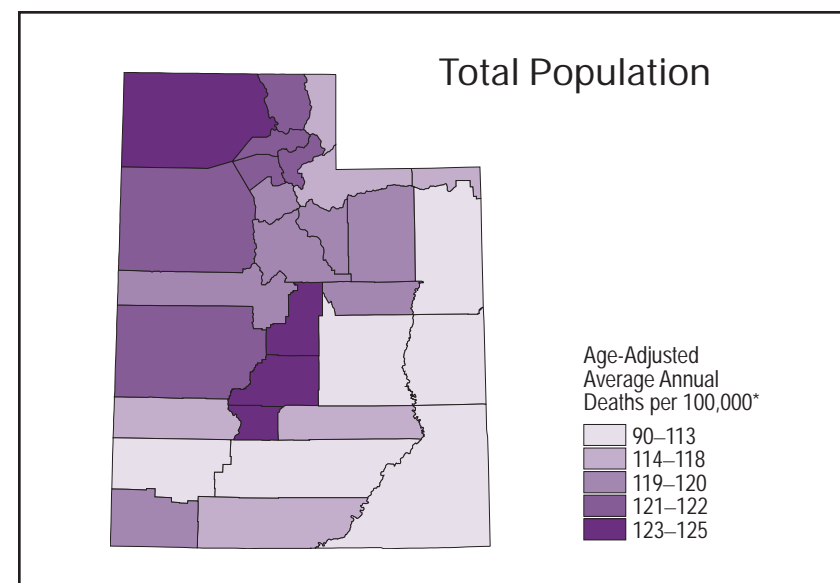
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Utah

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,659	61	79
Asians and Pacific Islanders	16,507	113	105
Blacks	5,697	170	166
Hispanics [§]	40,679	98	79
Whites	783,907	119	117
Total Population	814,770	119	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,559	‡	77
Asians and Pacific Islanders	9,039	96	96
Blacks	2,487	180	153
Hispanics [§]	20,204	78	72
Whites	404,832	120	113
All Women	420,917	120	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,100	‡	80
Asians and Pacific Islanders	7,468	136	118
Blacks	3,210	‡	182
Hispanics [§]	20,475	121	88
Whites	379,075	114	121
All Men	393,853	114	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

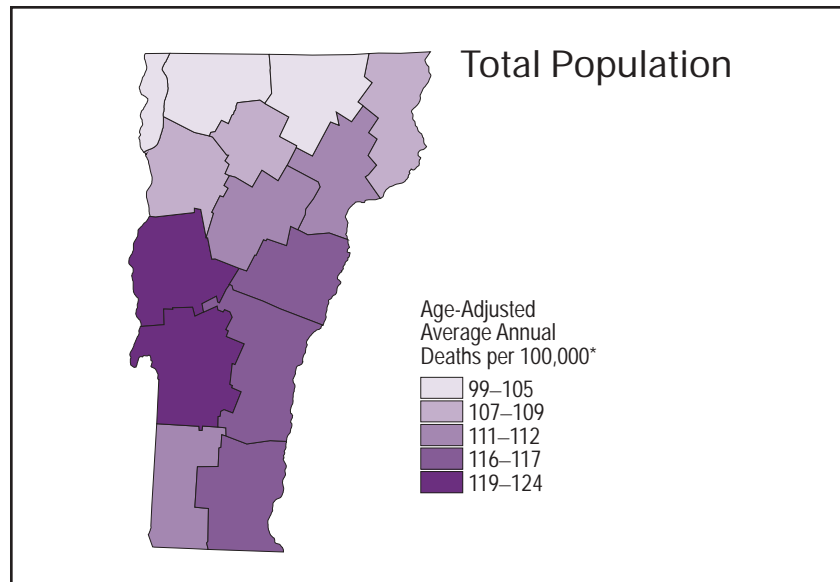
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	611	‡	79
Asians and Pacific Islanders	1,564	‡	105
Blacks	1,096	‡	166
Hispanics [§]	2,054	‡	79
Whites	309,303	115	117
Total Population	312,574	115	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	300	‡	77
Asians and Pacific Islanders	877	‡	96
Blacks	507	‡	153
Hispanics [§]	1,048	‡	72
Whites	161,032	112	113
All Women	162,716	112	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	311	‡	80
Asians and Pacific Islanders	687	‡	118
Blacks	589	‡	182
Hispanics [§]	1,006	‡	88
Whites	148,271	117	121
All Men	149,858	118	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

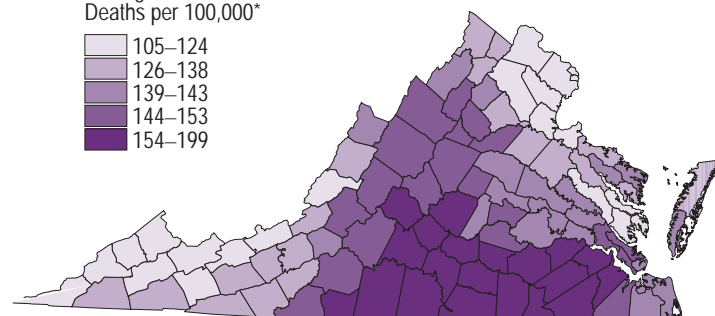
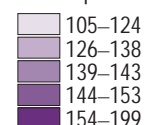
Virginia

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,493	‡	79
Asians and Pacific Islanders	105,009	87	105
Blacks	594,457	188	166
Hispanics [§]	87,972	54	79
Whites	2,704,502	128	117
Total Population	3,412,461	137	121

Total Population

Age-Adjusted
Average Annual
Deaths per 100,000*



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,261	‡	77
Asians and Pacific Islanders	57,770	80	96
Blacks	324,950	171	153
Hispanics [§]	45,518	53	72
Whites	1,416,319	122	113
All Women	1,803,300	130	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,232	‡	80
Asians and Pacific Islanders	47,239	96	118
Blacks	269,507	211	182
Hispanics [§]	42,454	52	88
Whites	1,288,183	135	121
All Men	1,609,161	146	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

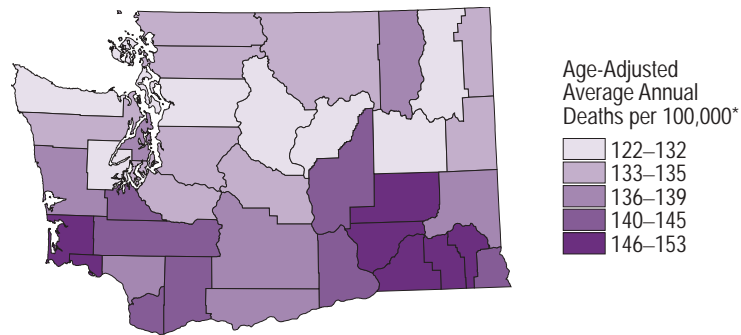
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	39,743	145	79
Asians and Pacific Islanders	136,619	124	105
Blacks	77,348	173	166
Hispanics [§]	103,083	77	79
Whites	2,618,570	133	117
Total Population	2,872,280	134	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	20,444	159	77
Asians and Pacific Islanders	76,680	109	96
Blacks	36,642	171	153
Hispanics [§]	49,886	60	72
Whites	1,346,674	131	113
All Women	1,480,440	132	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	19,299	126	80
Asians and Pacific Islanders	59,939	144	118
Blacks	40,706	175	182
Hispanics [§]	53,197	100	88
Whites	1,271,896	134	121
All Men	1,391,840	135	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

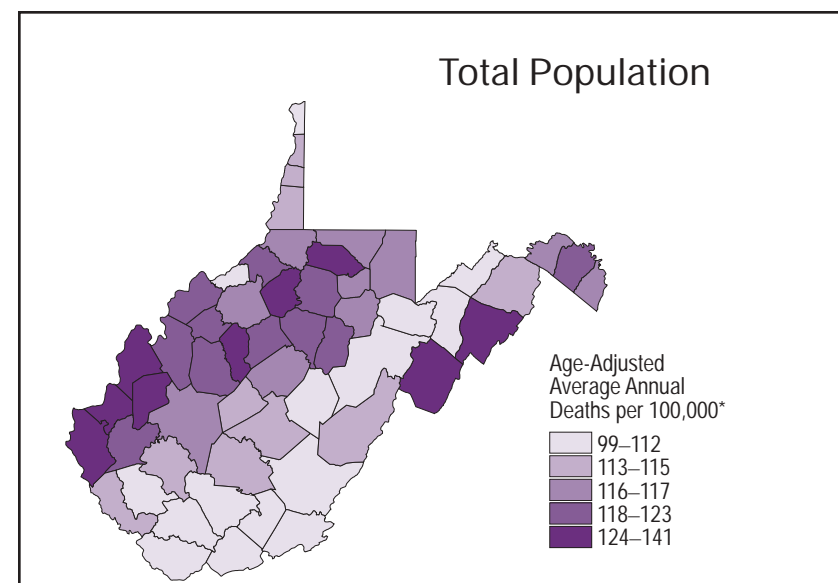
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

West Virginia

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,358	‡	79
Asians and Pacific Islanders	3,984	‡	105
Blacks	27,916	137	166
Hispanics [§]	4,546	‡	79
Whites	958,901	117	117
Total Population	992,159	118	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	695	‡	77
Asians and Pacific Islanders	2,200	‡	96
Blacks	15,620	122	153
Hispanics [§]	2,386	‡	72
Whites	512,755	115	113
All Women	531,270	115	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	663	‡	80
Asians and Pacific Islanders	1,784	‡	118
Blacks	12,296	161	182
Hispanics [§]	2,160	‡	88
Whites	446,146	119	121
All Men	460,889	120	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

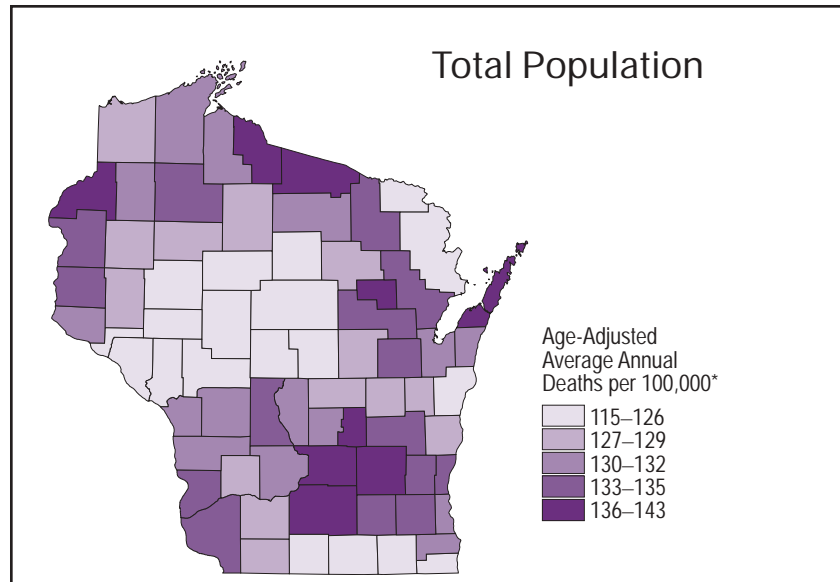
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,515	180	79
Asians and Pacific Islanders	22,532	141	105
Blacks	100,153	178	166
Hispanics [§]	41,309	49	79
Whites	2,530,308	128	117
Total Population	2,668,508	130	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,046	170	77
Asians and Pacific Islanders	12,047	126	96
Blacks	55,077	160	153
Hispanics [§]	20,171	52	72
Whites	1,322,019	122	113
All Women	1,397,189	123	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,469	192	80
Asians and Pacific Islanders	10,485	167	118
Blacks	45,076	198	182
Hispanics [§]	21,138	45	88
Whites	1,208,289	136	121
All Men	1,271,319	138	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

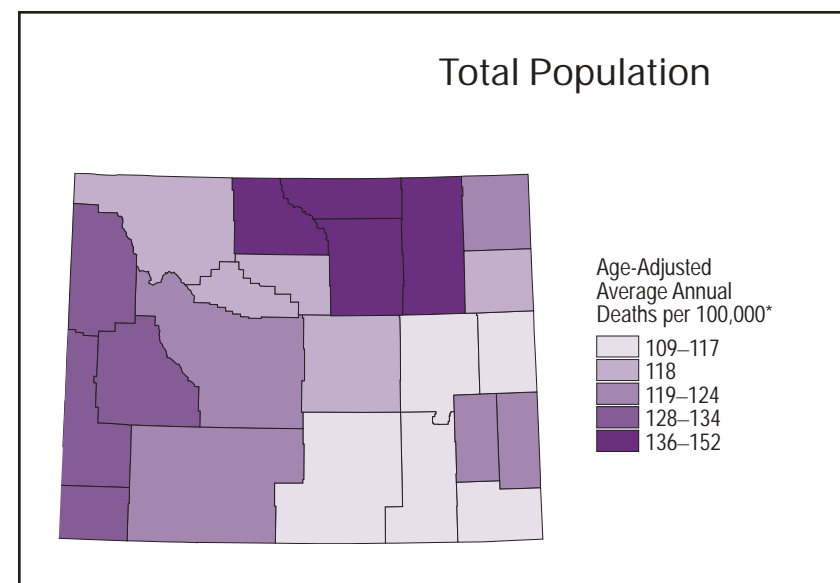
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Wyoming

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,493	150	79
Asians and Pacific Islanders	1,420	†	105
Blacks	1,479	†	166
Hispanics [§]	10,621	106	79
Whites	238,024	126	117
Total Population	244,416	126	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,851	†	77
Asians and Pacific Islanders	865	†	96
Blacks	686	†	153
Hispanics [§]	5,279	106	72
Whites	119,877	124	113
All Women	123,279	124	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,642	†	80
Asians and Pacific Islanders	555	†	118
Blacks	793	†	182
Hispanics [§]	5,342	105	88
Whites	118,147	128	121
All Men	121,137	128	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.
[†]Insufficient data to calculate a stroke death rate.
[§]Includes data for Hispanics in all racial groups.

Miners leave their shift at the Meadow River
Coal Mine in Lookout, West Virginia.



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4 State Maps and Tables of Stroke Mortality

In this section, state maps of the spatially smoothed, age-adjusted stroke death rates by county are presented separately for each state, the District of Columbia, and New York City. To create these state maps, we used the same stroke death rates generated for the national maps. A description of the methods used to calculate the rates can be found in Appendix B. Each county rate is based on a spatial moving average of that county and its neighbors. Therefore, for counties that are located along state borders, neighboring counties in adjacent states contributed to the smoothed rate for those counties, even though the neighboring counties are not displayed on the state map. State maps of the geographic disparities within each racial and ethnic group are not included in this publication but are available on the CDC interactive Web site at www.cdc.gov/cvh/maps.

For each map, the spatially smoothed, age-adjusted county death rates within each state were ranked from highest to lowest and then categorized into quintiles. The legend that accompanies each map indicates the range of county rates. A graded color scheme differentiates each quintile, with the darkest color representing counties with the highest rates and the lightest color representing counties with the lowest rates. Counties for which insufficient data existed to calculate a rate are shaded gray.

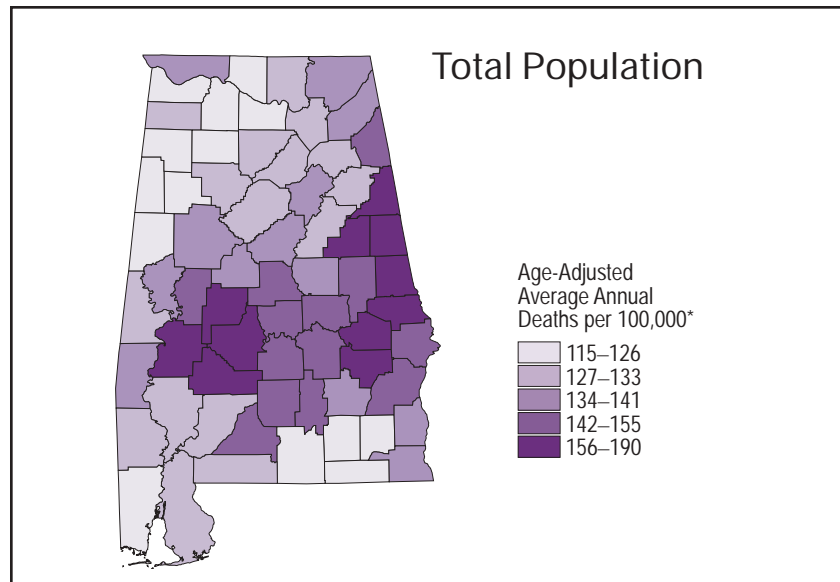
Because the range of stroke death rates varies substantially by state, the quintile cutpoints are different for each state map. Consequently, the range of values represented by a

given quintile varies from map to map. To determine whether the death rates were higher or lower for one state compared with another, the reader can refer to the tables of death rates presented for each state in this section or to the tables in Appendix A.

The state maps are accompanied by tables that display summary data by racial and ethnic group for women and men separately as well as for the state population as a whole. Each table provides data on the state population, the state stroke death rate, and the corresponding national stroke death rate. Data in these tables are not spatially smoothed. Under the federal data-reporting scheme, “Hispanic” is considered a designation of ethnicity, not race. Therefore, data for Hispanics are presented twice in the state tables and throughout the *Atlas of Stroke Mortality*—once under the category of “Hispanics,” which includes Hispanics of all racial identities (e.g., Hispanic blacks, Hispanic whites), and again under any of the four racial categories (American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, and whites) according to a person’s racial identity. Consequently, data for the five racial and ethnic groups are not mutually exclusive.

For part of the study period, Oklahoma and New Hampshire did not collect data on Hispanic origin on death certificates. Consequently, we were unable to report stroke death rates for Hispanics in these states.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,758	‡	79
Asians and Pacific Islanders	11,453	‡	105
Blacks	475,760	180	166
Hispanics [§]	14,463	47	79
Whites	1,722,420	124	117
Total Population	2,216,391	135	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,591	‡	77
Asians and Pacific Islanders	6,521	‡	96
Blacks	271,858	162	153
Hispanics [§]	7,043	55	72
Whites	916,014	120	113
All Women	1,197,984	128	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,167	‡	80
Asians and Pacific Islanders	4,932	‡	118
Blacks	203,902	205	182
Hispanics [§]	7,420	‡	88
Whites	806,406	129	121
All Men	1,018,407	142	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

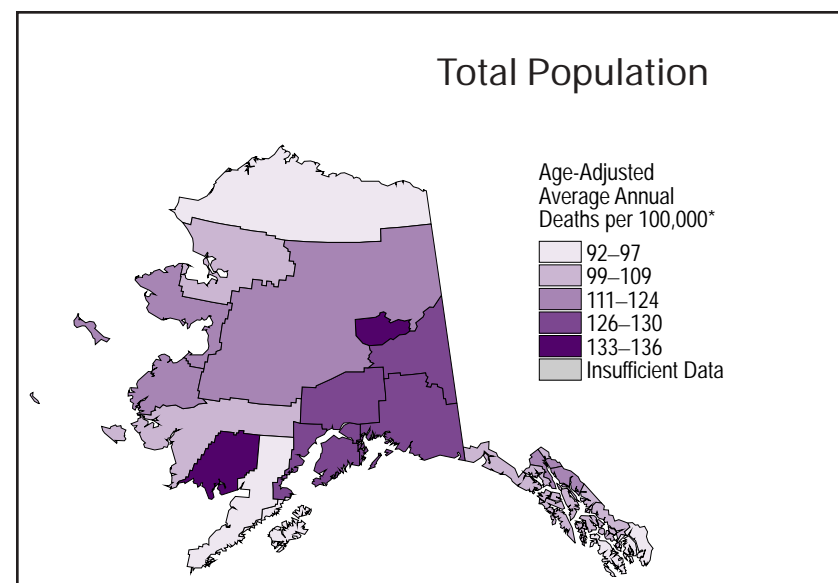
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Alaska

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	32,325	158	79
Asians and Pacific Islanders	11,424	158	105
Blacks	8,398	†	166
Hispanics [§]	8,218	†	79
Whites	224,935	118	117
Total Population	277,082	125	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	16,073	177	77
Asians and Pacific Islanders	6,379	136	96
Blacks	3,911	†	153
Hispanics [§]	3,947	†	72
Whites	103,230	123	113
All Women	129,593	131	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	16,252	133	80
Asians and Pacific Islanders	5,045	201	118
Blacks	4,487	†	182
Hispanics [§]	4,271	†	88
Whites	121,705	110	121
All Men	147,489	116	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

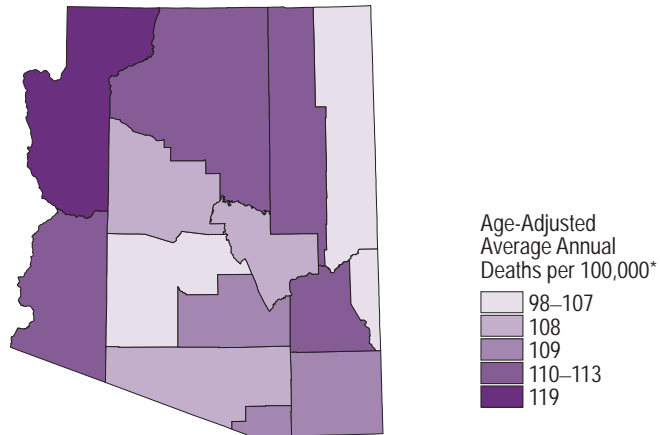
standard 2000 U.S. population.

† Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	83,595	101	79
Asians and Pacific Islanders	38,740	113	105
Blacks	66,157	127	166
Hispanics [§]	337,549	102	79
Whites	2,101,803	108	117
Total Population	2,290,295	108	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	44,656	98	77
Asians and Pacific Islanders	21,873	99	96
Blacks	33,283	127	153
Hispanics [§]	173,582	94	72
Whites	1,096,340	107	113
All Women	1,196,152	108	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	38,939	106	80
Asians and Pacific Islanders	16,867	130	118
Blacks	32,874	125	182
Hispanics [§]	163,967	111	88
Whites	1,005,463	106	121
All Men	1,094,143	107	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

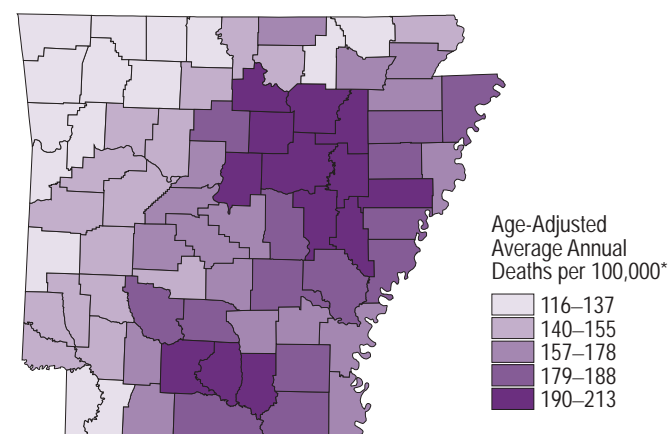
Stroke Death Rates, 1991–1998

Arkansas

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,752	‡	79
Asians and Pacific Islanders	6,972	‡	105
Blacks	159,310	225	166
Hispanics [§]	13,877	‡	79
Whites	1,123,662	157	117
Total Population	1,295,696	163	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,010	‡	77
Asians and Pacific Islanders	3,937	‡	96
Blacks	90,977	207	153
Hispanics [§]	6,686	‡	72
Whites	597,319	151	113
All Women	695,243	158	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,742	‡	80
Asians and Pacific Islanders	3,035	‡	118
Blacks	68,333	248	182
Hispanics [§]	7,191	‡	88
Whites	526,343	161	121
All Men	600,453	168	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

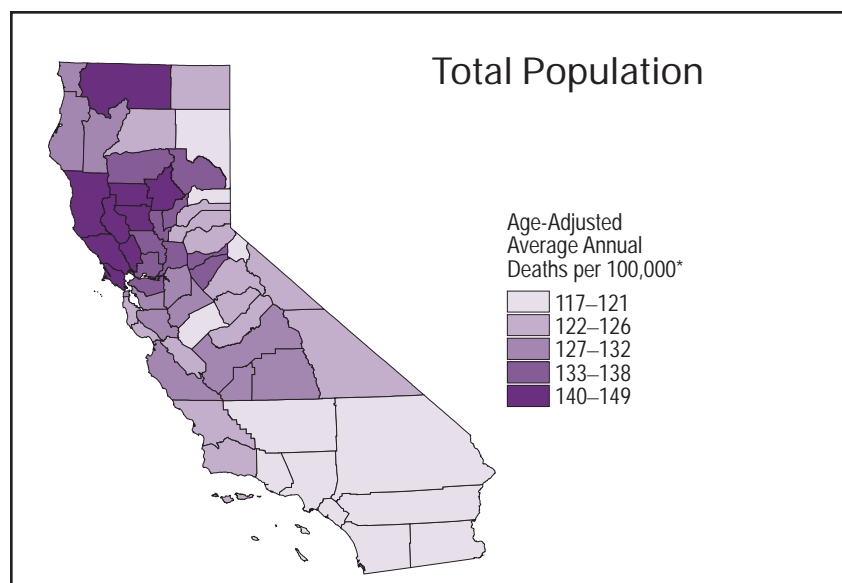
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	133,613	51	79
Asians and Pacific Islanders	1,768,624	118	105
Blacks	1,058,338	169	166
Hispanics [§]	3,279,030	87	79
Whites	12,430,753	121	117
Total Population	15,391,328	124	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	69,857	53	77
Asians and Pacific Islanders	954,477	106	96
Blacks	558,578	165	153
Hispanics [§]	1,666,525	81	72
Whites	6,413,760	119	113
All Women	7,996,672	121	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	63,756	48	80
Asians and Pacific Islanders	814,147	134	118
Blacks	499,760	173	182
Hispanics [§]	1,612,505	93	88
Whites	6,016,993	123	121
All Men	7,394,656	126	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

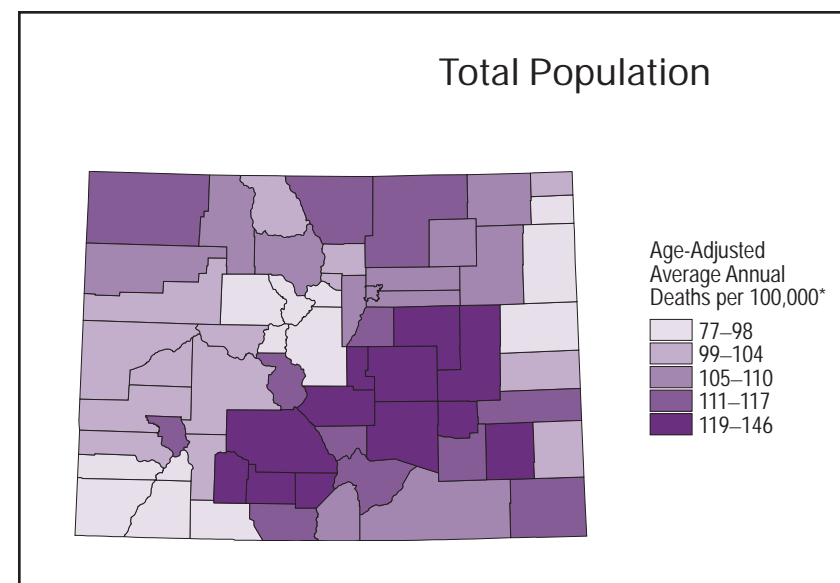
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Colorado

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	14,954	59	79
Asians and Pacific Islanders	38,309	82	105
Blacks	71,853	151	166
Hispanics [§]	213,209	96	79
Whites	1,889,906	111	117
Total Population	2,015,022	112	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,731	75	77
Asians and Pacific Islanders	21,794	75	96
Blacks	35,887	152	153
Hispanics [§]	108,691	89	72
Whites	975,949	111	113
All Women	1,041,361	112	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,223	‡	80
Asians and Pacific Islanders	16,515	93	118
Blacks	35,966	141	182
Hispanics [§]	104,518	107	88
Whites	913,957	109	121
All Men	973,661	109	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

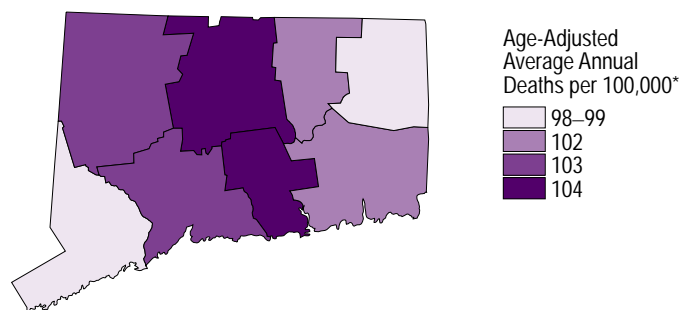
standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,386	‡	79
Asians and Pacific Islanders	32,080	66	105
Blacks	124,275	121	166
Hispanics [§]	91,096	56	79
Whites	1,581,206	101	117
Total Population	1,740,947	103	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,778	‡	77
Asians and Pacific Islanders	16,673	74	96
Blacks	69,310	115	153
Hispanics [§]	49,147	52	72
Whites	841,738	97	113
All Women	929,499	98	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,608	‡	80
Asians and Pacific Islanders	15,407	55	118
Blacks	54,965	125	182
Hispanics [§]	41,949	61	88
Whites	739,468	106	121
All Men	811,448	107	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

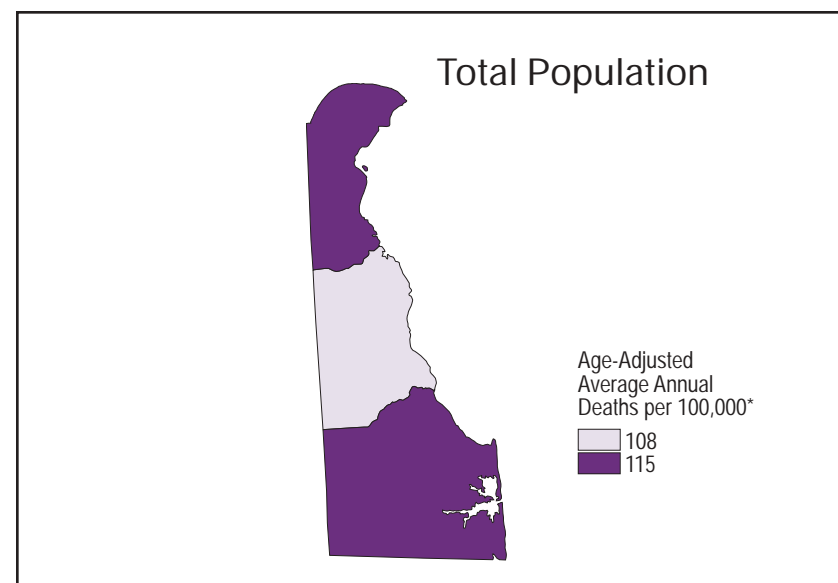
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Delaware

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,077	‡	79
Asians and Pacific Islanders	6,772	‡	105
Blacks	60,332	153	166
Hispanics [§]	8,204	‡	79
Whites	312,354	100	117
Total Population	380,535	106	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	559	‡	77
Asians and Pacific Islanders	3,645	‡	96
Blacks	33,275	144	153
Hispanics [§]	4,094	‡	72
Whites	164,049	96	113
All Women	201,528	102	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	518	‡	80
Asians and Pacific Islanders	3,127	‡	118
Blacks	27,057	164	182
Hispanics [§]	4,110	‡	88
Whites	148,305	102	121
All Men	179,007	109	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

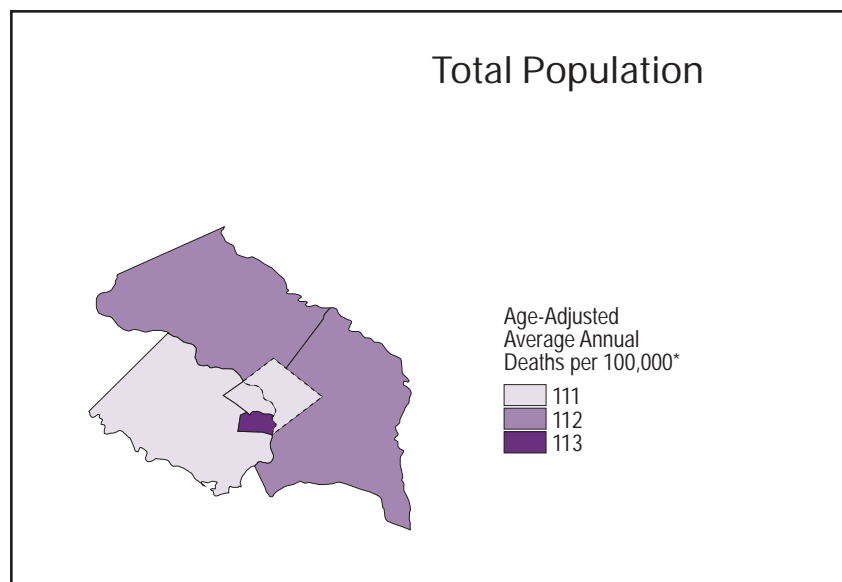
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	776	‡	79
Asians and Pacific Islanders	6,370	‡	105
Blacks	178,359	132	166
Hispanics [§]	14,934	‡	79
Whites	92,816	93	117
Total Population	278,321	120	121

Women			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	433	‡	77
Asians and Pacific Islanders	3,630	‡	96
Blacks	102,412	123	153
Hispanics [§]	7,802	‡	72
Whites	47,130	87	113
All Women	153,605	113	117

Men			
Race and Ethnicity	District Population 1998	District Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	343	‡	80
Asians and Pacific Islanders	2,740	‡	118
Blacks	75,947	144	182
Hispanics [§]	7,132	‡	88
Whites	45,686	102	121
All Men	124,716	129	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

District of Columbia

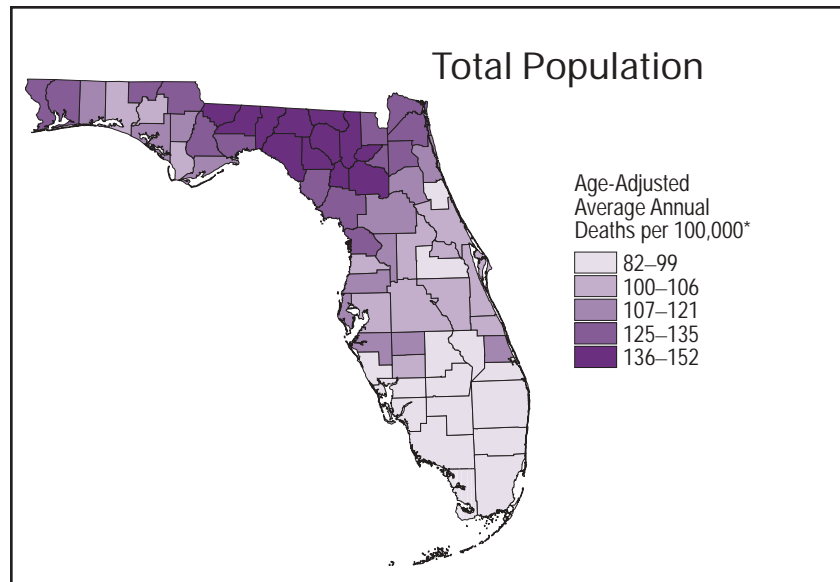
The map of stroke death rates for the District of Columbia displays spatially smoothed, age-adjusted rates for the District of Columbia and all contiguous counties of the bordering states. The border of the District of Columbia is represented by a dashed line. The stroke death rates presented in the tables are not spatially smoothed and therefore do not incorporate data from the contiguous counties.

Latinos celebrate their culture
at an annual festival in the District of Columbia.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	26,073	34	79
Asians and Pacific Islanders	119,163	55	105
Blacks	895,601	181	166
Hispanics [§]	1,062,845	66	79
Whites	7,202,542	97	117
Total Population	8,243,379	102	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	13,263	‡	77
Asians and Pacific Islanders	66,947	53	96
Blacks	492,461	170	153
Hispanics [§]	567,759	61	72
Whites	3,820,822	93	113
All Women	4,393,493	98	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	12,810	41	80
Asians and Pacific Islanders	52,216	57	118
Blacks	403,140	194	182
Hispanics [§]	495,086	73	88
Whites	3,381,720	100	121
All Men	3,849,886	106	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.
[‡]Insufficient data to calculate a stroke death rate.
[§]Includes data for Hispanics in all racial groups.

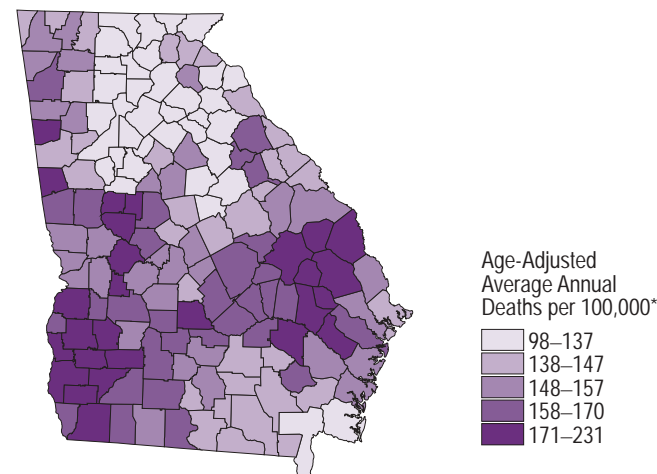
Stroke Death Rates, 1991–1998

Georgia

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,026	‡	79
Asians and Pacific Islanders	59,519	93	105
Blacks	871,811	191	166
Hispanics [§]	66,638	43	79
Whites	2,704,908	134	117
Total Population	3,644,264	146	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,060	‡	77
Asians and Pacific Islanders	32,097	85	96
Blacks	491,907	171	153
Hispanics [§]	32,331	45	72
Whites	1,414,393	129	113
All Women	1,942,457	138	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,966	‡	80
Asians and Pacific Islanders	27,422	103	118
Blacks	379,904	219	182
Hispanics [§]	34,307	40	88
Whites	1,290,515	141	121
All Men	1,701,807	155	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

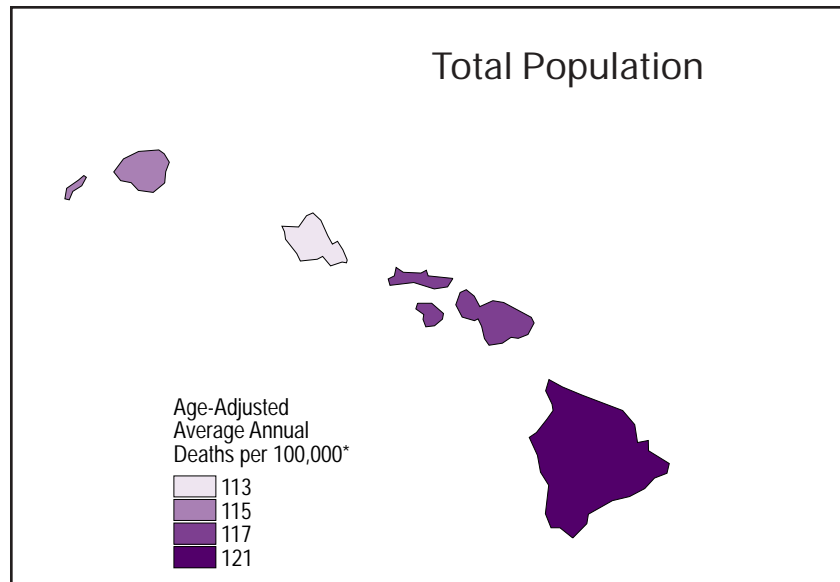
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,545	‡	79
Asians and Pacific Islanders	403,858	129	105
Blacks	10,656	74	166
Hispanics [§]	35,738	89	79
Whites	203,566	87	117
Total Population	620,625	116	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,231	‡	77
Asians and Pacific Islanders	214,449	113	96
Blacks	4,707	‡	153
Hispanics [§]	17,816	67	72
Whites	99,057	84	113
All Women	319,444	105	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,314	‡	80
Asians and Pacific Islanders	189,409	147	118
Blacks	5,949	‡	182
Hispanics [§]	17,922	111	88
Whites	104,509	86	121
All Men	301,181	129	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

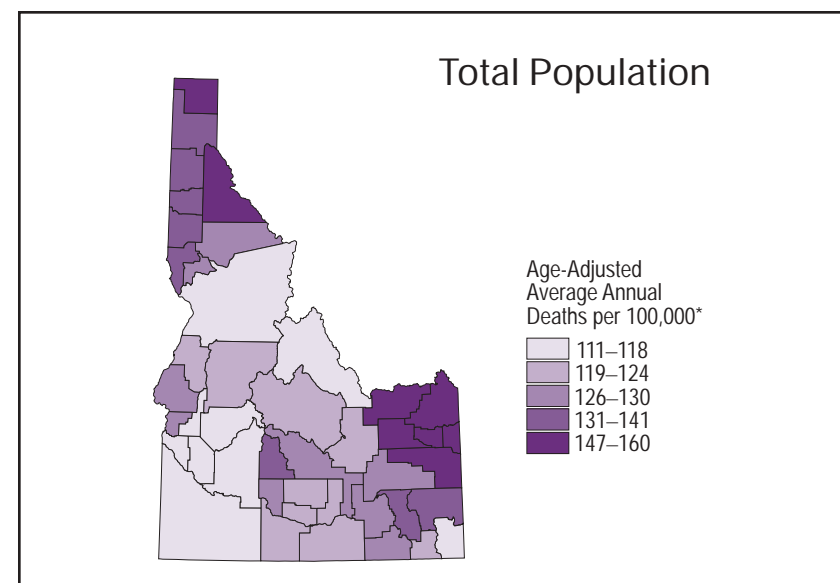
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Idaho

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,033	119	79
Asians and Pacific Islanders	5,029	145	105
Blacks	2,244	†	166
Hispanics [§]	24,662	89	79
Whites	574,551	128	117
Total Population	587,857	129	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,159	†	77
Asians and Pacific Islanders	2,828	†	96
Blacks	1,004	†	153
Hispanics [§]	11,635	77	72
Whites	294,314	130	113
All Women	301,305	130	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,874	†	80
Asians and Pacific Islanders	2,201	†	118
Blacks	1,240	†	182
Hispanics [§]	13,027	104	88
Whites	280,237	125	121
All Men	286,552	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

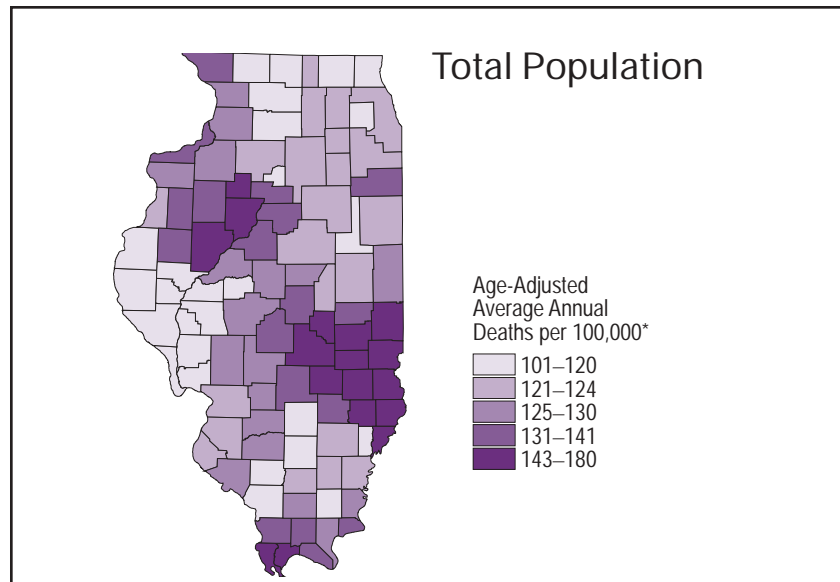
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	11,930	‡	79
Asians and Pacific Islanders	177,868	69	105
Blacks	763,896	153	166
Hispanics [§]	399,799	56	79
Whites	5,066,948	121	117
Total Population	6,020,642	125	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,101	‡	77
Asians and Pacific Islanders	94,488	61	96
Blacks	432,955	143	153
Hispanics [§]	197,533	49	72
Whites	2,675,419	115	113
All Women	3,208,963	118	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,829	‡	80
Asians and Pacific Islanders	83,380	79	118
Blacks	330,941	166	182
Hispanics [§]	202,266	65	88
Whites	2,391,529	129	121
All Men	2,811,679	133	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

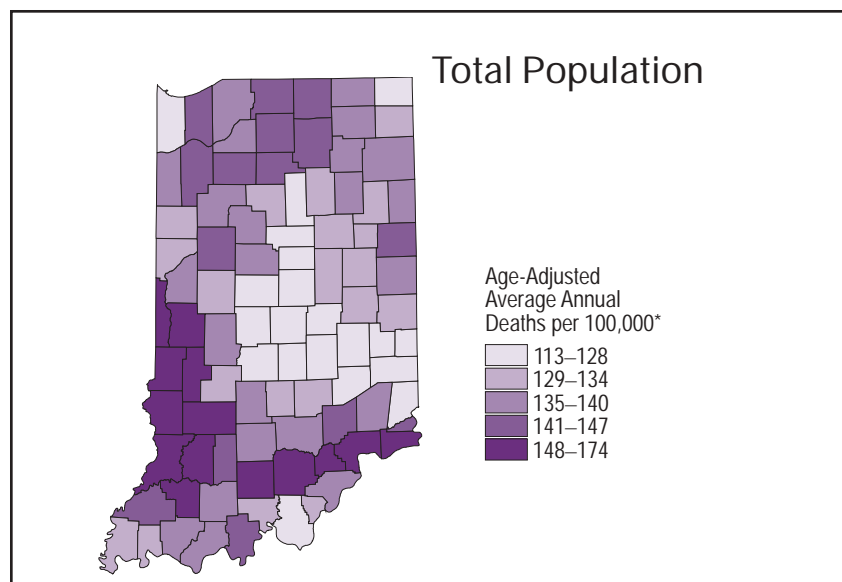
[§]Includes data for Hispanics in all racial groups.

African American men came from across the country to participate in the 1995 Million Man March in the District of Columbia to advocate for unity, atonement, and brotherhood.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,646	‡	79
Asians and Pacific Islanders	21,843	57	105
Blacks	205,260	162	166
Hispanics [§]	50,036	60	79
Whites	2,742,701	136	117
Total Population	2,976,450	138	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,401	‡	77
Asians and Pacific Islanders	11,809	63	96
Blacks	113,629	151	153
Hispanics [§]	25,075	49	72
Whites	1,454,290	132	113
All Women	1,583,129	134	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,245	‡	80
Asians and Pacific Islanders	10,034	‡	118
Blacks	91,631	176	182
Hispanics [§]	24,961	74	88
Whites	1,288,411	139	121
All Men	1,393,321	141	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

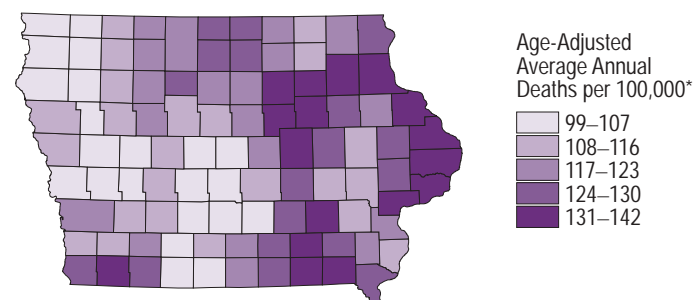
Stroke Death Rates, 1991–1998

Iowa

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,869	‡	79
Asians and Pacific Islanders	10,741	103	105
Blacks	20,539	162	166
Hispanics [§]	16,550	61	79
Whites	1,463,128	118	117
Total Population	1,497,277	119	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,503	‡	77
Asians and Pacific Islanders	5,807	‡	96
Blacks	10,490	128	153
Hispanics [§]	8,168	54	72
Whites	778,166	113	113
All Women	795,966	113	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,366	‡	80
Asians and Pacific Islanders	4,934	‡	118
Blacks	10,049	212	182
Hispanics [§]	8,382	‡	88
Whites	684,962	124	121
All Men	701,311	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

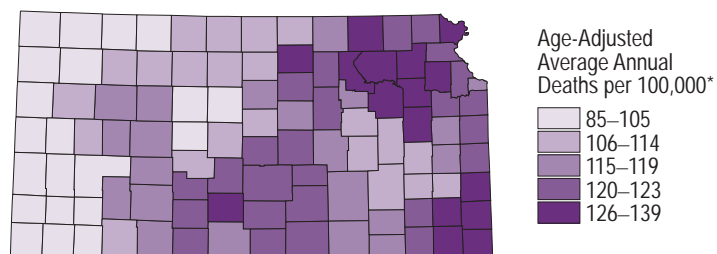
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,279	90	79
Asians and Pacific Islanders	16,019	88	105
Blacks	61,399	183	166
Hispanics [§]	43,299	79	79
Whites	1,242,261	118	117
Total Population	1,328,958	120	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,859	72	77
Asians and Pacific Islanders	9,023	84	96
Blacks	32,410	174	153
Hispanics [§]	21,181	70	72
Whites	653,848	114	113
All Women	700,140	116	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,420	109	80
Asians and Pacific Islanders	6,996	[‡]	118
Blacks	28,989	197	182
Hispanics [§]	22,118	88	88
Whites	588,413	122	121
All Men	628,818	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

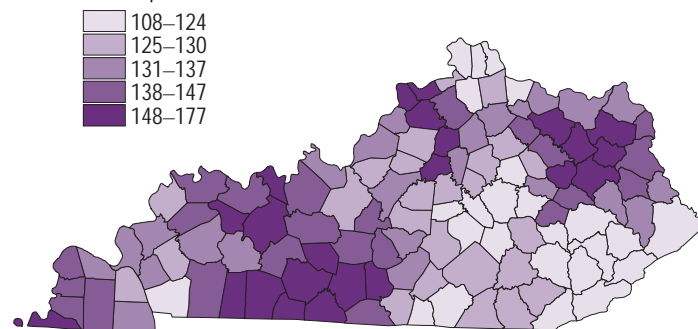
Kentucky

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,763	‡	79
Asians and Pacific Islanders	10,449	87	105
Blacks	122,041	165	166
Hispanics [§]	10,712	87	79
Whites	1,874,871	132	117
Total Population	2,010,124	133	121

Total Population

Age-Adjusted
Average Annual
Deaths per 100,000*



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,419	‡	77
Asians and Pacific Islanders	5,721	‡	96
Blacks	68,439	158	153
Hispanics [§]	5,498	91	72
Whites	996,724	127	113
All Women	1,072,303	128	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,344	‡	80
Asians and Pacific Islanders	4,728	‡	118
Blacks	53,602	172	182
Hispanics [§]	5,214	‡	88
Whites	878,147	138	121
All Men	937,821	140	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

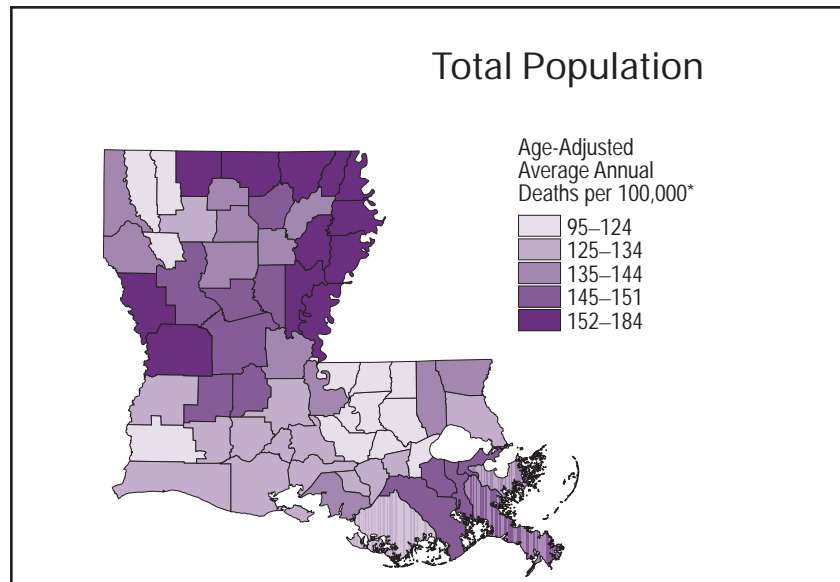
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,958	79	79
Asians and Pacific Islanders	21,132	88	105
Blacks	564,526	172	166
Hispanics [§]	50,792	55	79
Whites	1,510,022	121	117
Total Population	2,103,638	133	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,009	‡	77
Asians and Pacific Islanders	11,206	82	96
Blacks	320,128	155	153
Hispanics [§]	26,611	45	72
Whites	797,703	116	113
All Women	1,133,046	126	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,949	‡	80
Asians and Pacific Islanders	9,926	95	118
Blacks	244,398	197	182
Hispanics [§]	24,181	72	88
Whites	712,319	128	121
All Men	970,592	143	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

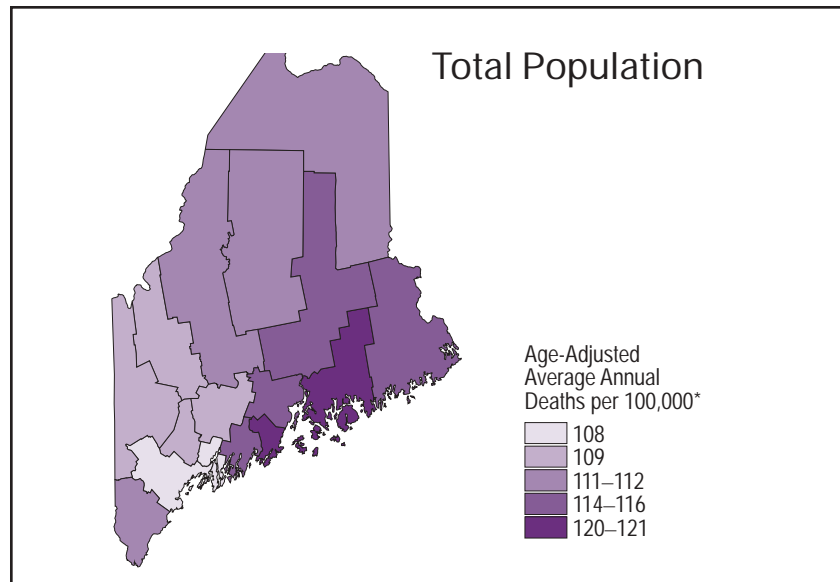
[§]Includes data for Hispanics in all racial groups.

Members of an employee bowling league
enjoy an outing in Atlanta, Georgia.



Greg Knobloch/CDC

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,306	‡	79
Asians and Pacific Islanders	3,475	‡	105
Blacks	2,083	‡	166
Hispanics [§]	3,116	‡	79
Whites	667,805	111	117
Total Population	675,669	111	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,150	‡	77
Asians and Pacific Islanders	1,984	‡	96
Blacks	896	‡	153
Hispanics [§]	1,646	‡	72
Whites	351,557	105	113
All Women	355,587	105	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,156	‡	80
Asians and Pacific Islanders	1,491	‡	118
Blacks	1,187	‡	182
Hispanics [§]	1,470	‡	88
Whites	316,248	119	121
All Men	320,082	119	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

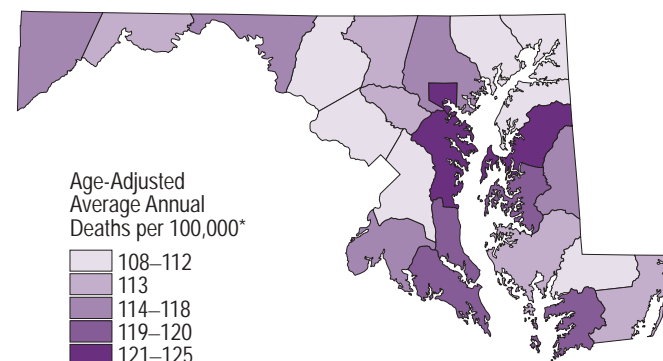
Stroke Death Rates, 1991–1998

Maryland

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,082	70	79
Asians and Pacific Islanders	92,238	92	105
Blacks	632,523	145	166
Hispanics [§]	71,398	22	79
Whites	1,884,306	110	117
Total Population	2,616,149	117	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,606	‡	77
Asians and Pacific Islanders	49,347	94	96
Blacks	350,491	134	153
Hispanics [§]	37,603	23	72
Whites	984,813	106	113
All Women	1,388,257	112	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,476	‡	80
Asians and Pacific Islanders	42,891	90	118
Blacks	282,032	159	182
Hispanics [§]	33,795	22	88
Whites	899,493	113	121
All Men	1,227,892	122	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

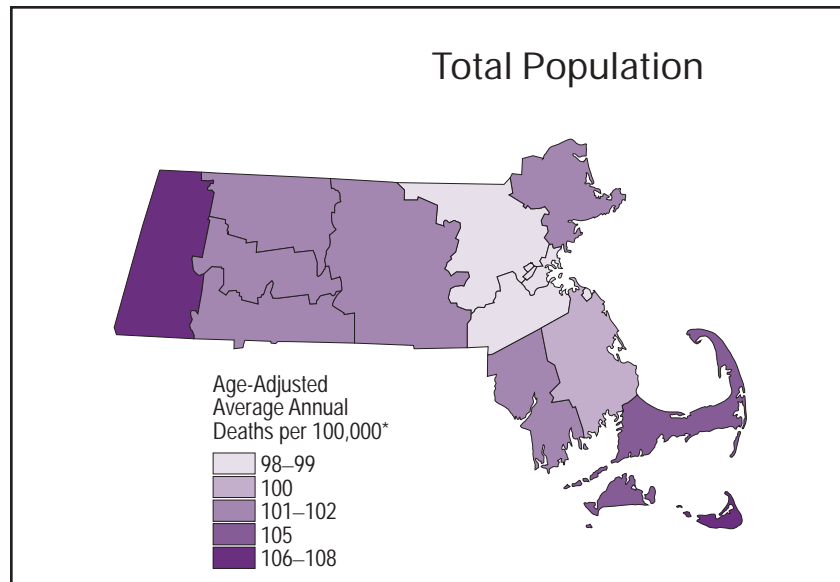
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,101	‡	79
Asians and Pacific Islanders	78,066	87	105
Blacks	145,793	125	166
Hispanics [§]	117,093	51	79
Whites	2,974,102	99	117
Total Population	3,204,062	100	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,199	‡	77
Asians and Pacific Islanders	40,702	82	96
Blacks	78,707	121	153
Hispanics [§]	62,141	45	72
Whites	1,601,110	96	113
All Women	1,723,718	97	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,902	‡	80
Asians and Pacific Islanders	37,364	96	118
Blacks	67,086	124	182
Hispanics [§]	54,952	59	88
Whites	1,372,992	101	121
All Men	1,480,344	102	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

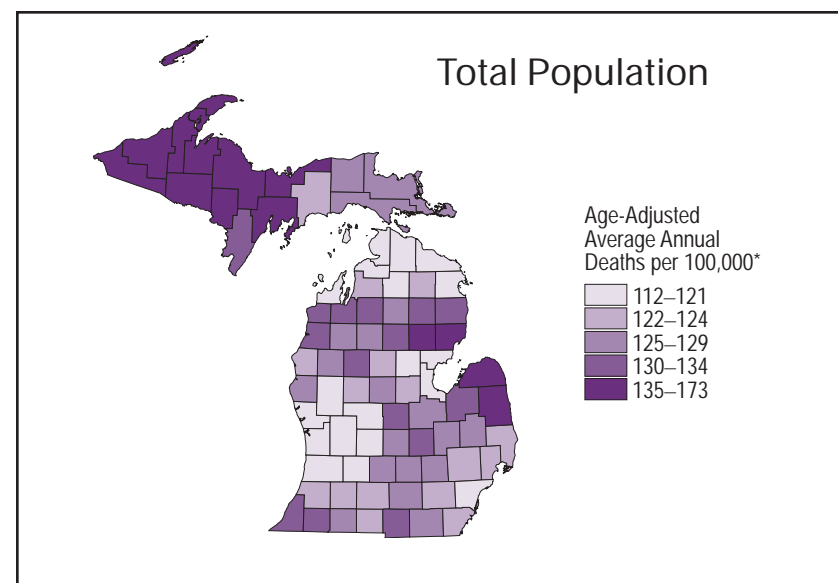
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Michigan

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	23,903	160	79
Asians and Pacific Islanders	60,889	91	105
Blacks	594,774	151	166
Hispanics [§]	89,839	79	79
Whites	4,275,967	121	117
Total Population	4,955,533	124	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	12,534	181	77
Asians and Pacific Islanders	32,163	86	96
Blacks	333,768	141	153
Hispanics [§]	45,399	68	72
Whites	2,246,945	117	113
All Women	2,625,410	120	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	11,369	124	80
Asians and Pacific Islanders	28,726	97	118
Blacks	261,006	162	182
Hispanics [§]	44,440	95	88
Whites	2,029,022	125	121
All Men	2,330,123	129	126

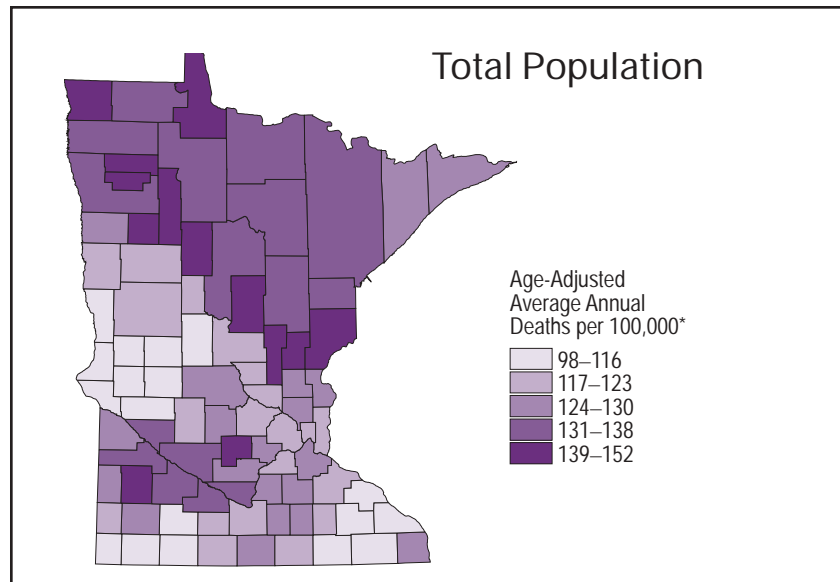
*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,298	102	79
Asians and Pacific Islanders	34,210	141	105
Blacks	45,784	158	166
Hispanics [§]	25,751	81	79
Whites	2,279,044	124	117
Total Population	2,377,336	125	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,603	97	77
Asians and Pacific Islanders	18,167	132	96
Blacks	22,050	155	153
Hispanics [§]	12,633	65	72
Whites	1,190,024	117	113
All Women	1,239,844	118	117

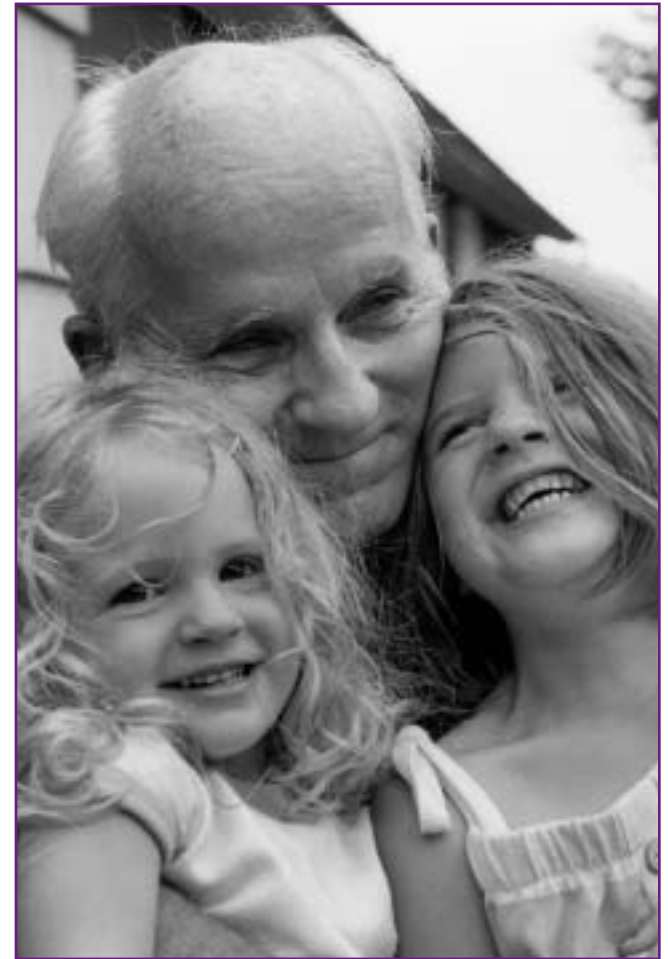
Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,695	109	80
Asians and Pacific Islanders	16,043	154	118
Blacks	23,734	157	182
Hispanics [§]	13,118	107	88
Whites	1,089,020	131	121
All Men	1,137,492	132	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

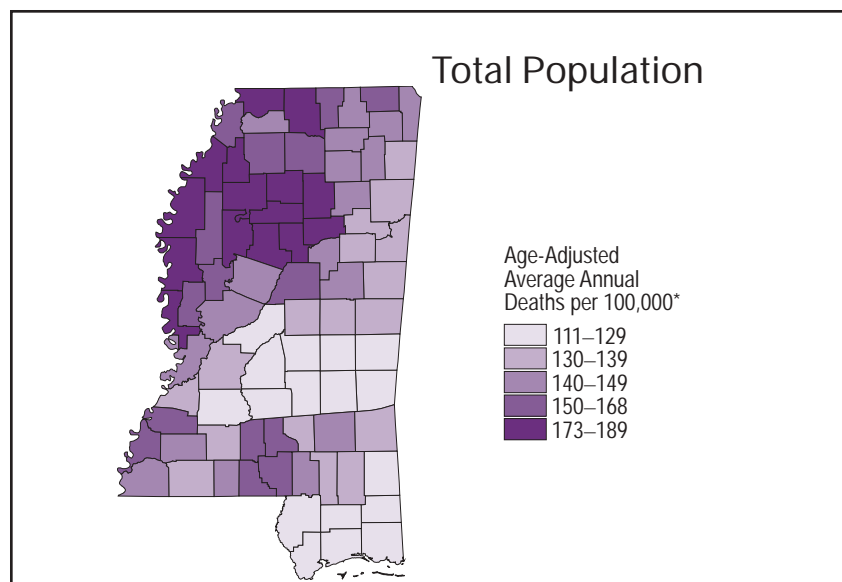
[§]Includes data for Hispanics in all racial groups.



A New York man hugs his granddaughters.

© Rick Reinhard

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,495	139	79
Asians and Pacific Islanders	6,827	91	105
Blacks	388,462	183	166
Hispanics [§]	8,337	†	79
Whites	915,397	125	117
Total Population	1,314,181	140	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,853	†	77
Asians and Pacific Islanders	3,890	†	96
Blacks	220,343	162	153
Hispanics [§]	4,350	†	72
Whites	487,332	118	113
All Women	713,418	130	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,642	†	80
Asians and Pacific Islanders	2,937	†	118
Blacks	168,119	212	182
Hispanics [§]	3,987	†	88
Whites	428,065	134	121
All Men	600,763	153	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

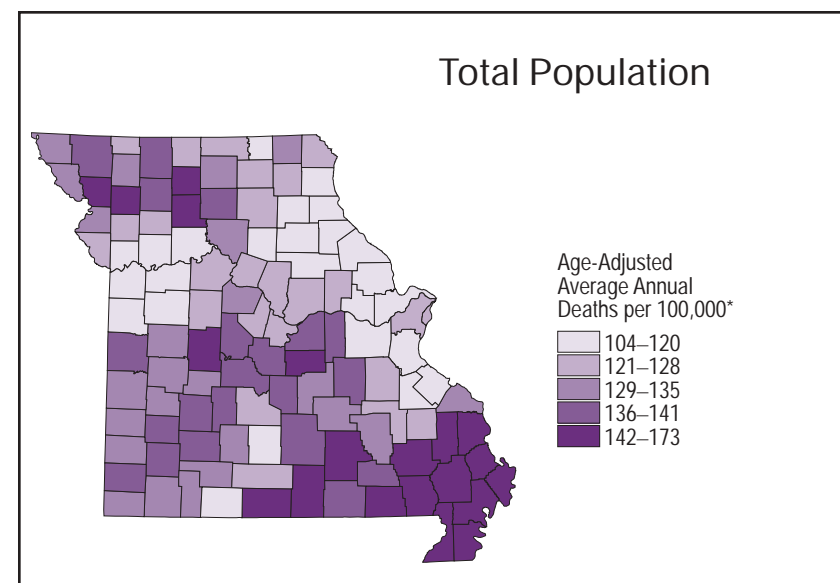
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Missouri

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,418	32	79
Asians and Pacific Islanders	22,700	115	105
Blacks	251,814	156	166
Hispanics [§]	30,845	82	79
Whites	2,505,179	124	117
Total Population	2,789,111	127	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,874	‡	77
Asians and Pacific Islanders	12,427	114	96
Blacks	143,196	139	153
Hispanics [§]	15,904	84	72
Whites	1,332,903	120	113
All Women	1,493,400	122	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,544	‡	80
Asians and Pacific Islanders	10,273	116	118
Blacks	108,618	180	182
Hispanics [§]	14,941	76	88
Whites	1,172,276	130	121
All Men	1,295,711	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

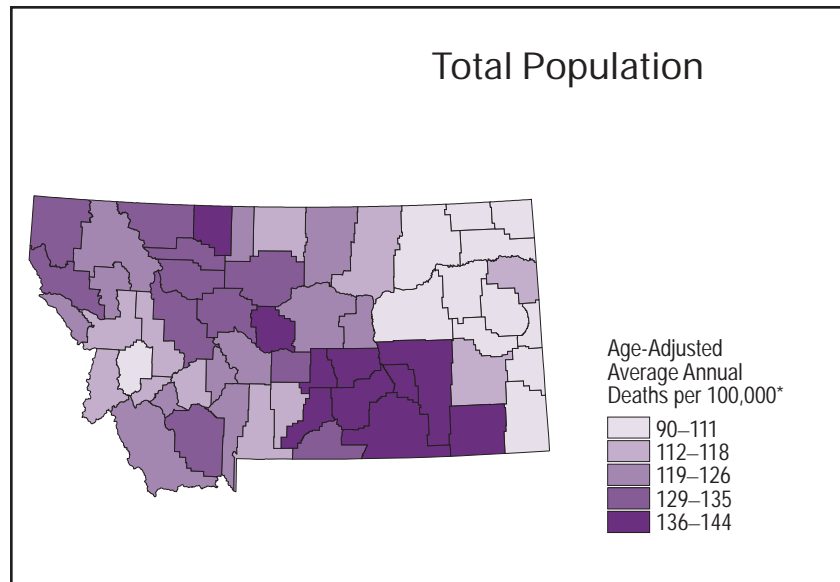
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,010	149	79
Asians and Pacific Islanders	1,769	†	105
Blacks	966	†	166
Hispanics [§]	5,704	108	79
Whites	449,085	123	117
Total Population	469,830	124	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,506	145	77
Asians and Pacific Islanders	1,102	†	96
Blacks	415	†	153
Hispanics [§]	2,896	†	72
Whites	229,755	120	113
All Women	240,778	122	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,504	152	80
Asians and Pacific Islanders	667	†	118
Blacks	551	†	182
Hispanics [§]	2,808	†	88
Whites	219,330	124	121
All Men	229,052	125	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

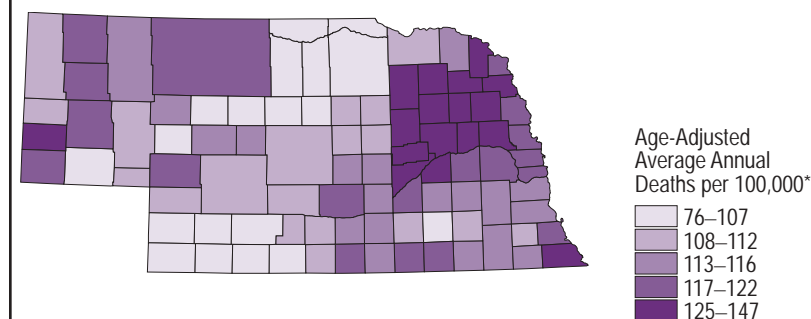
Stroke Death Rates, 1991–1998

Nebraska

Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,448	169	79
Asians and Pacific Islanders	6,646	†	105
Blacks	24,917	176	166
Hispanics [§]	21,033	51	79
Whites	802,211	116	117
Total Population	838,222	117	121

Total Population



Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,416	†	77
Asians and Pacific Islanders	3,712	†	96
Blacks	13,436	157	153
Hispanics [§]	10,388	†	72
Whites	423,009	109	113
All Women	442,573	110	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,032	296	80
Asians and Pacific Islanders	2,934	†	118
Blacks	11,481	203	182
Hispanics [§]	10,645	68	88
Whites	379,202	125	121
All Men	395,649	127	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

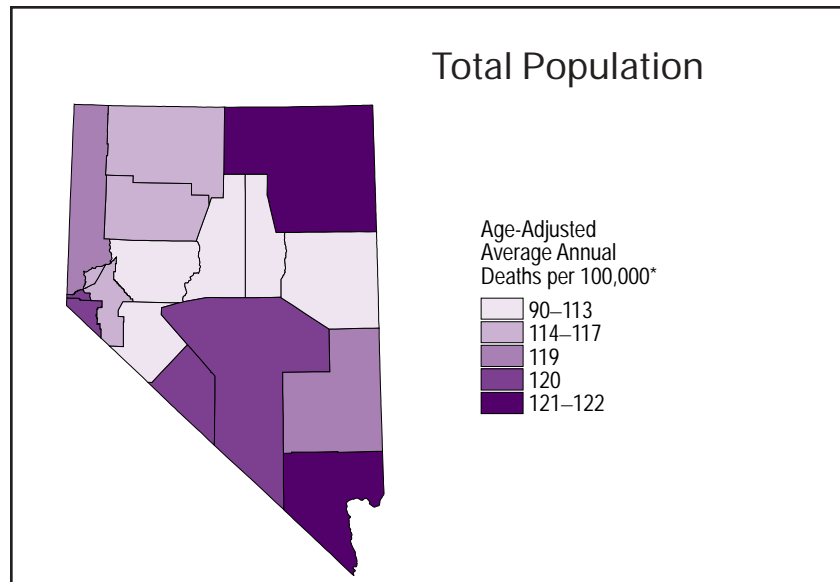
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	13,110	51	79
Asians and Pacific Islanders	36,169	112	105
Blacks	54,073	154	166
Hispanics [§]	90,437	49	79
Whites	773,114	117	117
Total Population	876,466	118	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,696	‡	77
Asians and Pacific Islanders	20,426	94	96
Blacks	27,654	148	153
Hispanics [§]	44,174	46	72
Whites	380,556	115	113
All Women	435,332	115	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,414	‡	80
Asians and Pacific Islanders	15,743	134	118
Blacks	26,419	156	182
Hispanics [§]	46,263	50	88
Whites	392,558	118	121
All Men	441,134	119	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

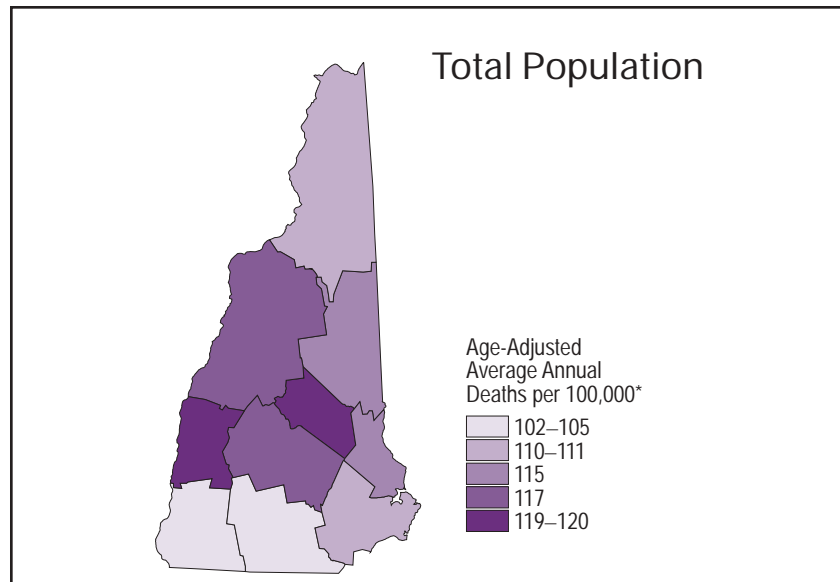
§Includes data for Hispanics in all racial groups.

Senior citizens dance in Seattle, Washington.



© Jim West

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	987	‡	79
Asians and Pacific Islanders	5,394	‡	105
Blacks	3,311	‡	166
Hispanics [§]	6,047	‡	79
Whites	598,831	118	117
Total Population	608,523	118	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	514	‡	77
Asians and Pacific Islanders	2,901	‡	96
Blacks	1,440	‡	153
Hispanics [§]	3,045	‡	72
Whites	310,929	116	113
All Women	315,784	116	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	473	‡	80
Asians and Pacific Islanders	2,493	‡	118
Blacks	1,871	‡	182
Hispanics [§]	3,002	‡	88
Whites	287,902	117	121
All Men	292,739	117	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

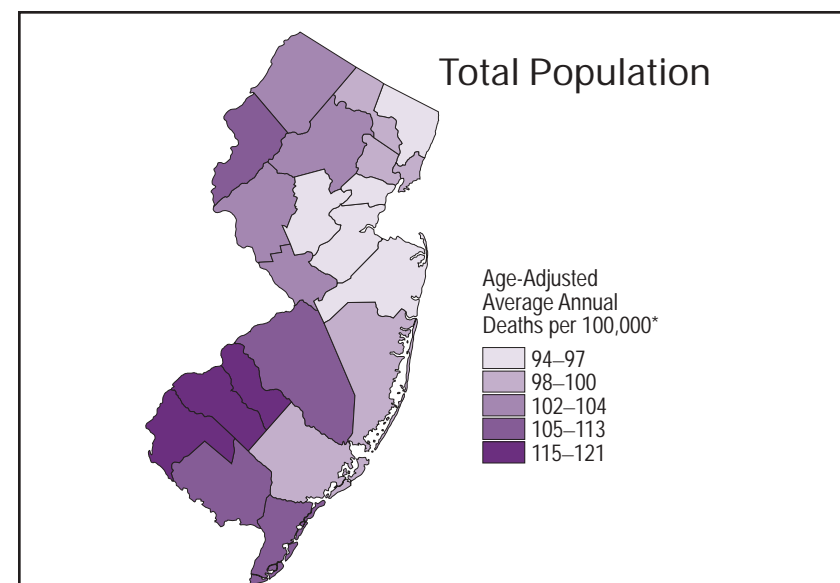
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

New Jersey

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,626	53	79
Asians and Pacific Islanders	204,817	59	105
Blacks	516,221	141	166
Hispanics [§]	404,607	54	79
Whites	3,563,224	97	117
Total Population	4,293,888	101	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,019	‡	77
Asians and Pacific Islanders	107,664	58	96
Blacks	287,779	135	153
Hispanics [§]	212,915	49	72
Whites	1,896,965	92	113
All Women	2,297,427	96	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,607	‡	80
Asians and Pacific Islanders	97,153	59	118
Blacks	228,442	147	182
Hispanics [§]	191,692	61	88
Whites	1,666,259	102	121
All Men	1,996,461	106	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

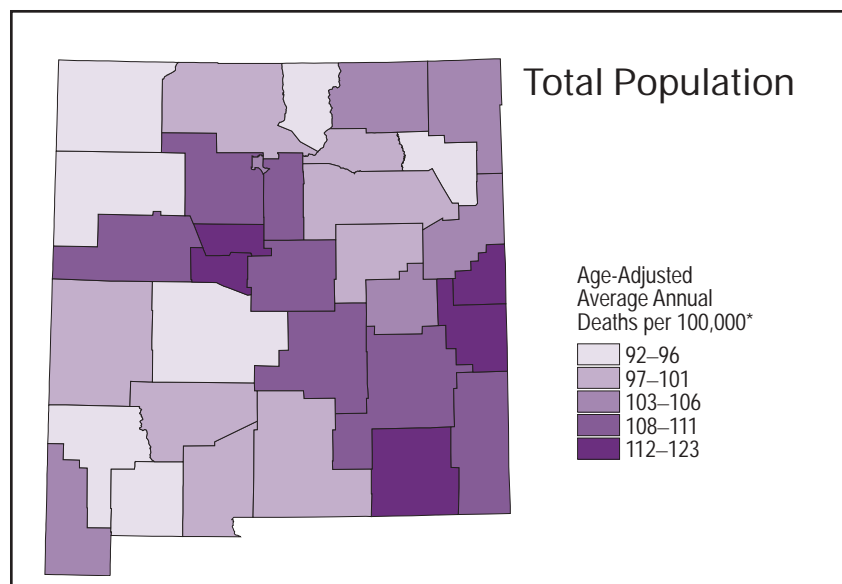
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	54,153	85	79
Asians and Pacific Islanders	9,922	108	105
Blacks	18,877	107	166
Hispanics [§]	285,305	106	79
Whites	760,509	106	117
Total Population	843,461	105	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	29,592	75	77
Asians and Pacific Islanders	5,750	†	96
Blacks	9,302	107	153
Hispanics [§]	147,733	101	72
Whites	395,350	106	113
All Women	439,994	105	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	24,561	100	80
Asians and Pacific Islanders	4,172	†	118
Blacks	9,575	104	182
Hispanics [§]	137,572	111	88
Whites	365,159	104	121
All Men	403,467	104	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

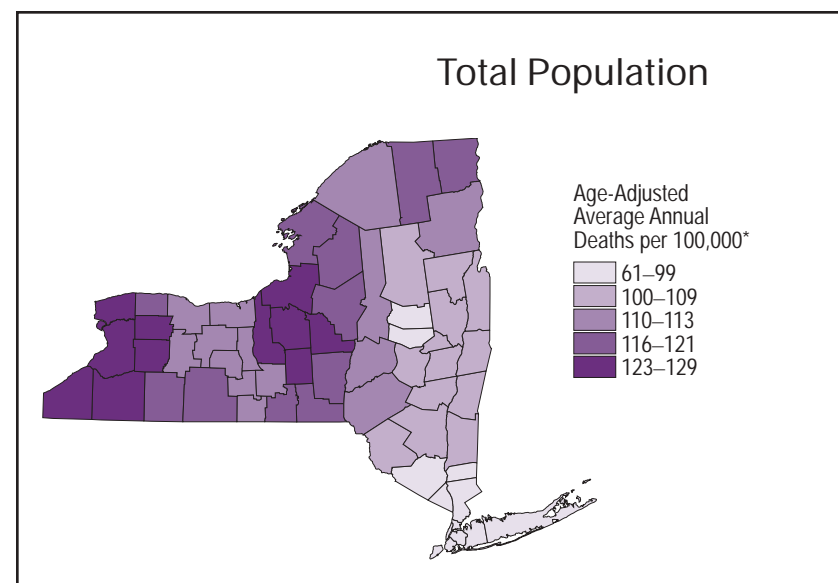
†Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

New York

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	32,679	48	79
Asians and Pacific Islanders	453,493	59	105
Blacks	1,423,231	95	166
Hispanics [§]	1,043,844	54	79
Whites	7,478,532	87	117
Total Population	9,387,935	89	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	17,253	44	77
Asians and Pacific Islanders	234,222	57	96
Blacks	813,464	90	153
Hispanics [§]	573,202	49	72
Whites	4,006,724	84	113
All Women	5,071,663	85	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,426	54	80
Asians and Pacific Islanders	219,271	60	118
Blacks	609,767	101	182
Hispanics [§]	470,642	61	88
Whites	3,471,808	90	121
All Men	4,316,272	91	126

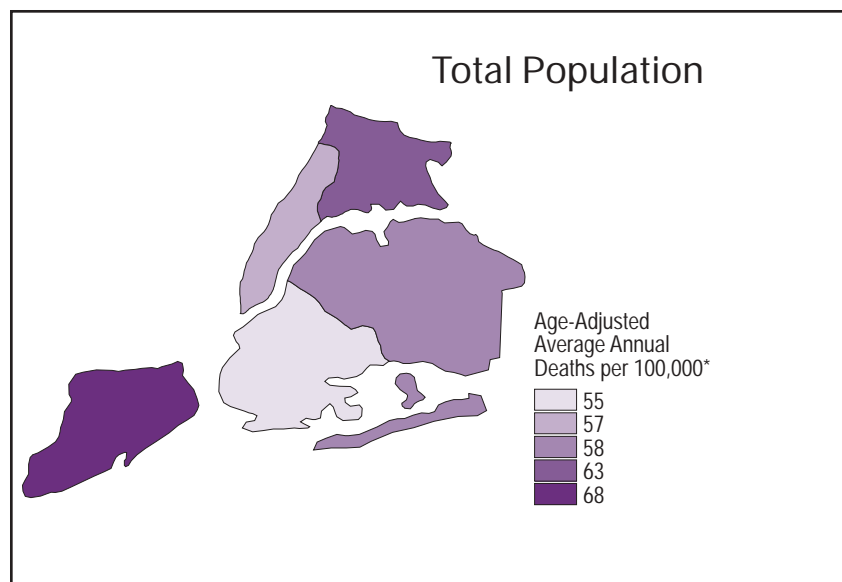
*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	14,894	‡	79
Asians and Pacific Islanders	337,658	61	105
Blacks	1,059,935	85	166
Hispanics [§]	839,003	54	79
Whites	2,338,518	56	117
Total Population	3,751,005	63	121

Women			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,996	‡	77
Asians and Pacific Islanders	172,939	57	96
Blacks	618,540	81	153
Hispanics [§]	470,513	49	72
Whites	1,280,216	53	113
All Women	2,079,691	60	117

Men			
Race and Ethnicity	City Population 1998	City Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,898	‡	80
Asians and Pacific Islanders	164,719	65	118
Blacks	441,395	90	182
Hispanics [§]	368,520	59	88
Whites	1,058,302	59	121
All Men	1,671,314	66	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

New York City

During 1991–1993, information on Hispanic origin was not reported on an average 18% of stroke death certificates for adults ages 35 years and older residing in New York City. During 1994–1998, the percentage of death certificates missing this information decreased to <3%. After examining New York City death certificate data for 1991–1998, we concluded that most deaths with “unknown” Hispanic origin occurred among non-Hispanic adults. Our calculations indicated that the percentage of stroke deaths among Hispanic adults increased slightly from 1991–1993 to 1994–1998, whereas the percentage of stroke deaths for non-Hispanic adults increased markedly after reporting improved in 1994.

However, because a proportion of the deaths with missing Hispanic origin data occurred among Hispanic adults, the stroke death rates reported here for Hispanic adults are likely underestimated. Erroneous reporting of Hispanics as whites on death certificates also causes rates to be underestimated for Hispanics (see Section 1). The extent of underestimation may have varied among the five city boroughs, so readers should be prudent when comparing county rates.

Distribution of Stroke Deaths by Hispanic Origin Among Persons Ages ≥ 35 Years, New York City

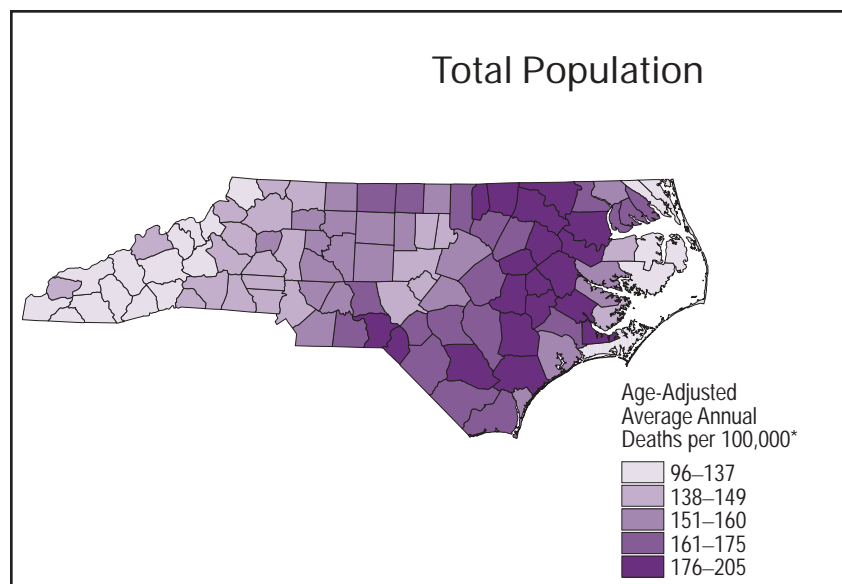
Year	Hispanic Origin		
	Non-Hispanic	Hispanic	Unknown
1991	73.8%	9.9%	16.4%
1992	69.3%	11.7%	19.0%
1993	69.0%	11.4%	19.6%
1994	84.6%	13.2%	2.3%
1995	83.3%	15.2%	1.5%
1996	82.6%	15.9%	1.6%
1997	83.9%	14.2%	1.9%
1998	82.4%	15.9%	1.8%

A carpenter works on the new International Brotherhood of Carpenters headquarters in the District of Columbia.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	37,358	145	79
Asians and Pacific Islanders	36,477	75	105
Blacks	712,268	210	166
Hispanics [§]	44,009	26	79
Whites	3,016,773	143	117
Total Population	3,802,876	155	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	19,729	133	77
Asians and Pacific Islanders	20,259	86	96
Blacks	401,959	190	153
Hispanics [§]	21,230	25	72
Whites	1,601,323	136	113
All Women	2,043,270	145	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	17,629	162	80
Asians and Pacific Islanders	16,218	59	118
Blacks	310,309	239	182
Hispanics [§]	22,779	†	88
Whites	1,415,450	152	121
All Men	1,759,606	166	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

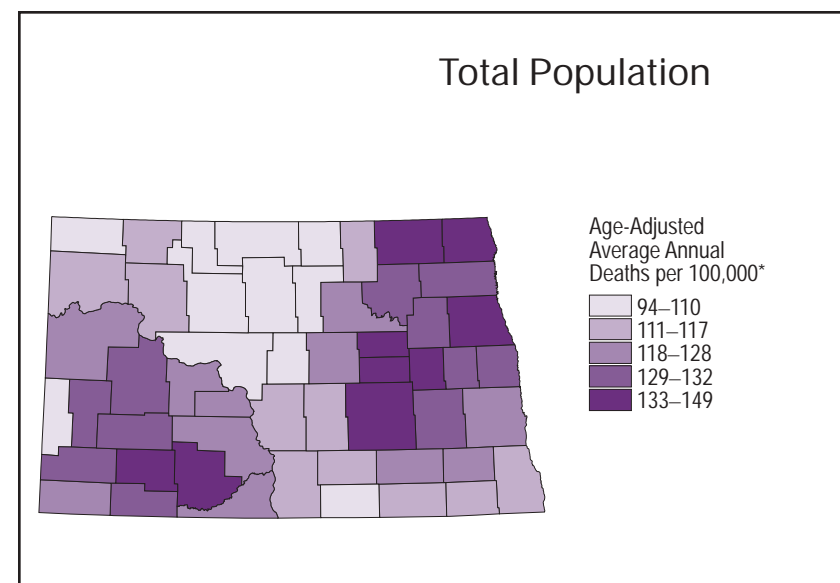
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

North Dakota

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,301	141	79
Asians and Pacific Islanders	1,589	†	105
Blacks	972	†	166
Hispanics [§]	1,628	†	79
Whites	315,511	121	117
Total Population	326,373	122	121



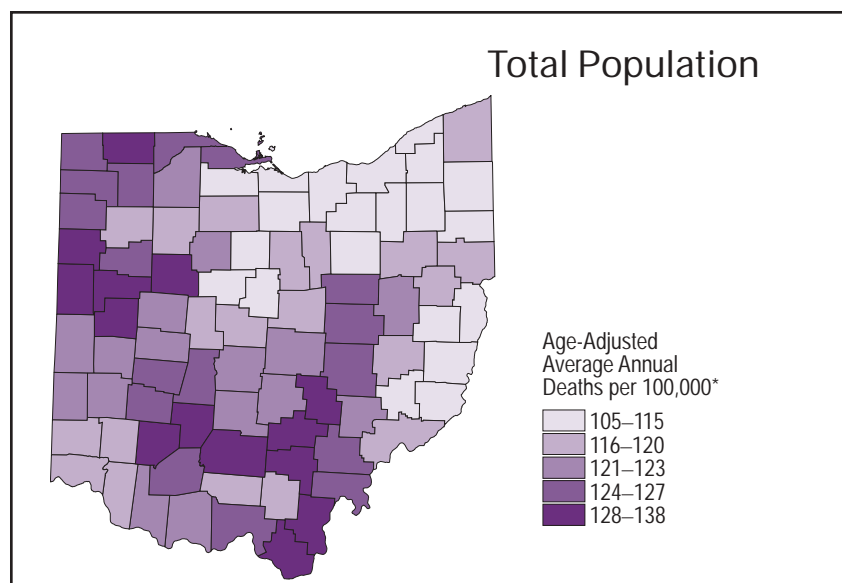
Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,583	134	77
Asians and Pacific Islanders	897	†	96
Blacks	426	†	153
Hispanics [§]	839	†	72
Whites	163,153	111	113
All Women	169,059	111	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,718	153	80
Asians and Pacific Islanders	692	†	118
Blacks	546	†	182
Hispanics [§]	789	†	88
Whites	152,358	135	121
All Men	157,314	136	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.
[†]Insufficient data to calculate a stroke death rate.
[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	10,784	‡	79
Asians and Pacific Islanders	52,750	69	105
Blacks	553,737	146	166
Hispanics [§]	63,933	58	79
Whites	5,150,152	115	117
Total Population	5,767,423	117	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,562	‡	77
Asians and Pacific Islanders	28,263	63	96
Blacks	310,818	135	153
Hispanics [§]	33,114	55	72
Whites	2,744,441	110	113
All Women	3,089,084	112	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,222	‡	80
Asians and Pacific Islanders	24,487	78	118
Blacks	242,919	161	182
Hispanics [§]	30,819	62	88
Whites	2,405,711	120	121
All Men	2,678,339	123	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

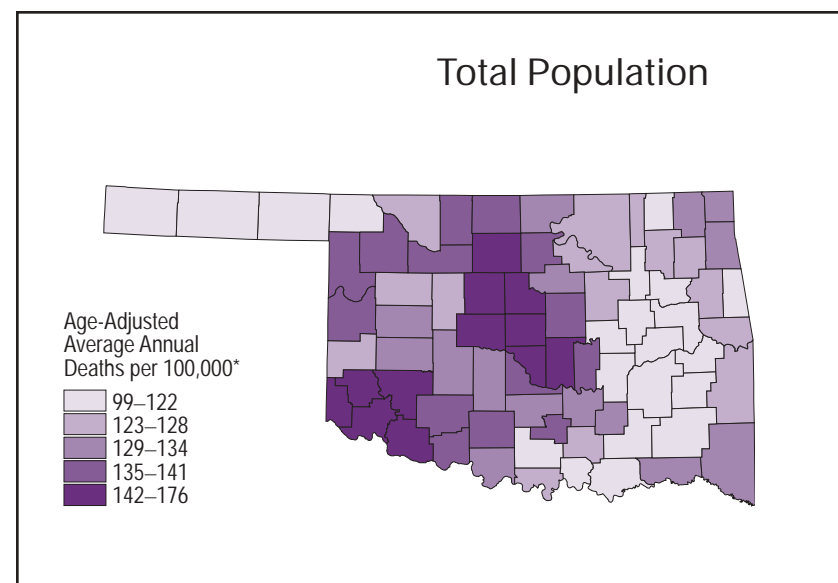
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Oklahoma

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	102,535	67	79
Asians and Pacific Islanders	16,925	124	105
Blacks	103,268	165	166
Hispanics [§]	39,600	18	79
Whites	1,472,070	133	117
Total Population	1,694,798	131	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	55,676	64	77
Asians and Pacific Islanders	9,632	126	96
Blacks	56,281	155	153
Hispanics [§]	19,644	†	72
Whites	780,337	131	113
All Women	901,926	128	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	46,859	69	80
Asians and Pacific Islanders	7,293	120	118
Blacks	46,987	178	182
Hispanics [§]	19,956	†	88
Whites	691,733	135	121
All Men	792,872	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

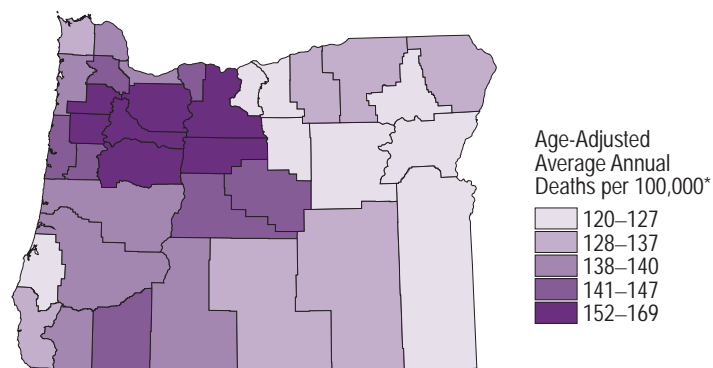
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	18,380	111	79
Asians and Pacific Islanders	41,042	129	105
Blacks	23,839	209	166
Hispanics [§]	57,711	75	79
Whites	1,644,771	145	117
Total Population	1,728,032	146	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	9,573	113	77
Asians and Pacific Islanders	22,467	145	96
Blacks	11,420	195	153
Hispanics [§]	27,365	68	72
Whites	854,890	143	113
All Women	898,350	144	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,807	105	80
Asians and Pacific Islanders	18,575	110	118
Blacks	12,419	225	182
Hispanics [§]	30,346	83	88
Whites	789,881	146	121
All Men	829,682	146	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

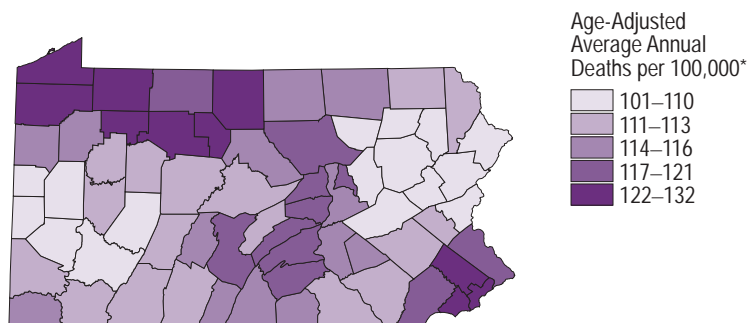
A high school principal attends a rally to support immigrants' rights and Latino voter registration in the District of Columbia.



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Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,873	40	79
Asians and Pacific Islanders	79,509	86	105
Blacks	515,730	149	166
Hispanics [§]	106,240	89	79
Whites	5,899,121	113	117
Total Population	6,502,233	116	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,040	‡	77
Asians and Pacific Islanders	42,476	86	96
Blacks	292,502	139	153
Hispanics [§]	55,247	80	72
Whites	3,169,892	109	113
All Women	3,508,910	111	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,833	‡	80
Asians and Pacific Islanders	37,033	85	118
Blacks	223,228	161	182
Hispanics [§]	50,993	100	88
Whites	2,729,229	118	121
All Men	2,993,323	121	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

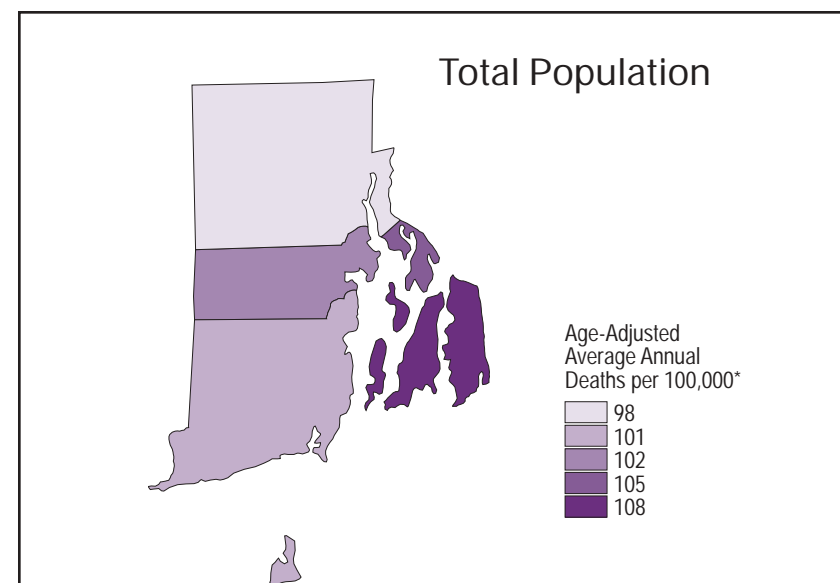
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Rhode Island

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,770	‡	79
Asians and Pacific Islanders	7,850	98	105
Blacks	18,251	157	166
Hispanics [§]	21,264	37	79
Whites	489,482	102	117
Total Population	517,353	103	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	967	‡	77
Asians and Pacific Islanders	4,131	‡	96
Blacks	9,661	161	153
Hispanics [§]	11,238	42	72
Whites	265,599	98	113
All Women	280,358	99	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	803	‡	80
Asians and Pacific Islanders	3,719	‡	118
Blacks	8,590	144	182
Hispanics [§]	10,026	‡	88
Whites	223,883	104	121
All Men	236,995	105	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

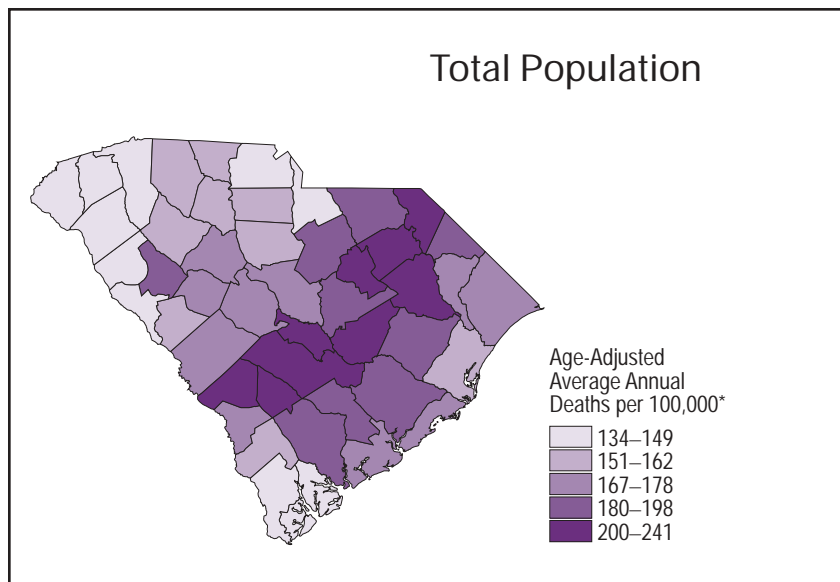
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,744	‡	79
Asians and Pacific Islanders	13,733	61	105
Blacks	489,945	237	166
Hispanics [§]	16,669	‡	79
Whites	1,424,035	149	117
Total Population	1,931,457	169	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,946	‡	77
Asians and Pacific Islanders	7,920	‡	96
Blacks	275,747	209	153
Hispanics [§]	8,557	‡	72
Whites	750,892	144	113
All Women	1,036,505	159	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,798	‡	80
Asians and Pacific Islanders	5,813	‡	118
Blacks	214,198	277	182
Hispanics [§]	8,112	‡	88
Whites	673,143	152	121
All Men	894,952	178	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

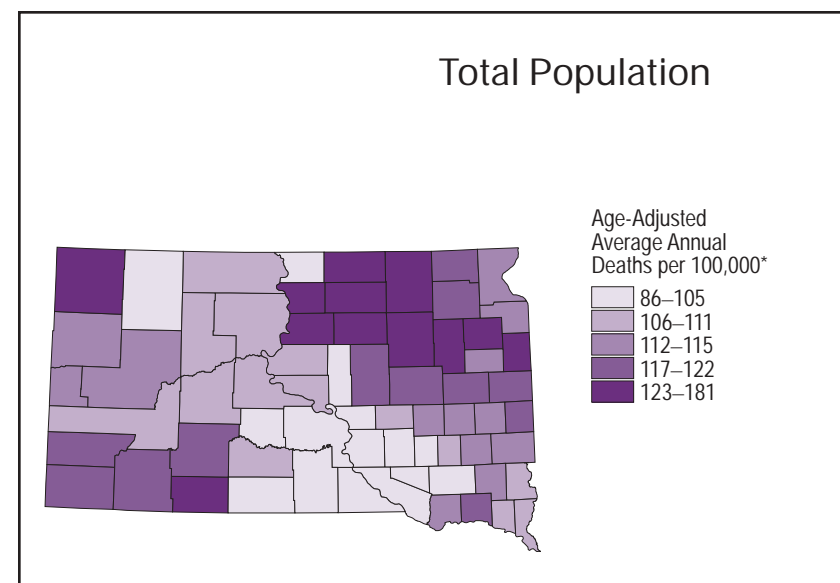
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

South Dakota

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,025	165	79
Asians and Pacific Islanders	1,387	†	105
Blacks	1,378	†	166
Hispanics [§]	2,423	†	79
Whites	348,904	115	117
Total Population	366,694	116	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,173	139	77
Asians and Pacific Islanders	864	†	96
Blacks	482	†	153
Hispanics [§]	1,206	†	72
Whites	181,889	107	113
All Women	191,408	108	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	6,852	198	80
Asians and Pacific Islanders	523	†	118
Blacks	896	†	182
Hispanics [§]	1,217	†	88
Whites	167,015	125	121
All Men	175,286	127	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

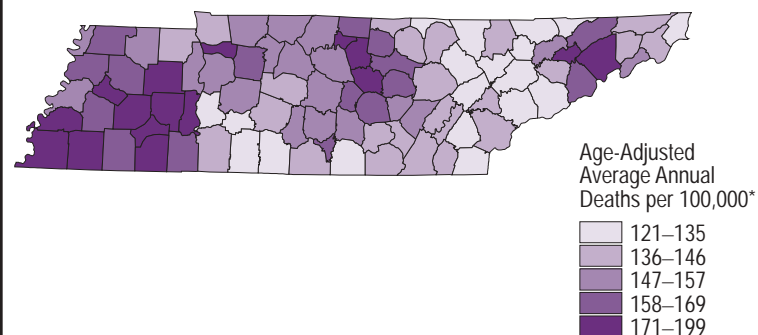
standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Total Population



Total

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	5,560	‡	79
Asians and Pacific Islanders	21,015	107	105
Blacks	372,168	220	166
Hispanics [§]	20,731	85	79
Whites	2,396,499	148	117
Total Population	2,795,242	156	121

Women

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,854	‡	77
Asians and Pacific Islanders	11,525	98	96
Blacks	212,016	198	153
Hispanics [§]	10,352	67	72
Whites	1,273,535	143	113
All Women	1,499,930	149	117

Men

Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	2,706	‡	80
Asians and Pacific Islanders	9,490	121	118
Blacks	160,152	254	182
Hispanics [§]	10,379	113	88
Whites	1,122,964	154	121
All Men	1,295,312	165	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

[‡]Insufficient data to calculate a stroke death rate.

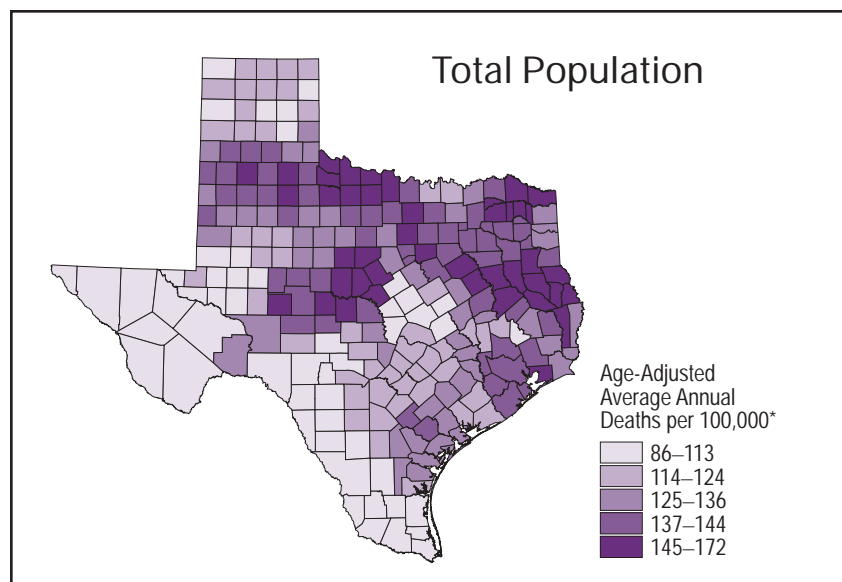
[§]Includes data for Hispanics in all racial groups.

A woman participates in one of the musical activities held weekly at a city-run senior center in Albuquerque, New Mexico.



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Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	41,732	13	79
Asians and Pacific Islanders	229,438	80	105
Blacks	999,293	182	166
Hispanics [§]	2,033,336	100	79
Whites	7,935,437	126	117
Total Population	9,205,900	130	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	21,003	‡	77
Asians and Pacific Islanders	122,232	78	96
Blacks	541,658	170	153
Hispanics [§]	1,055,918	89	72
Whites	4,144,947	122	113
All Women	4,829,840	126	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	20,729	‡	80
Asians and Pacific Islanders	107,206	82	118
Blacks	457,635	199	182
Hispanics [§]	977,418	113	88
Whites	3,790,490	128	121
All Men	4,376,060	134	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

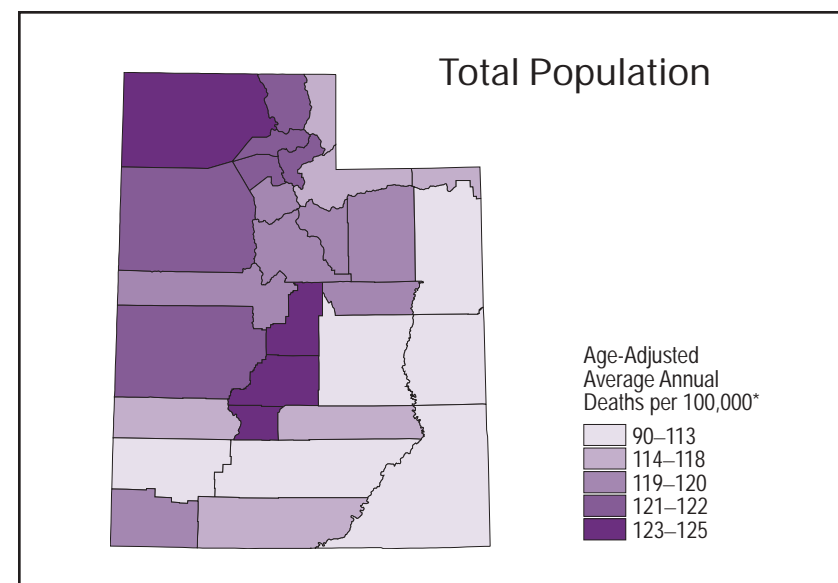
‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Utah

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,659	61	79
Asians and Pacific Islanders	16,507	113	105
Blacks	5,697	170	166
Hispanics [§]	40,679	98	79
Whites	783,907	119	117
Total Population	814,770	119	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,559	‡	77
Asians and Pacific Islanders	9,039	96	96
Blacks	2,487	180	153
Hispanics [§]	20,204	78	72
Whites	404,832	120	113
All Women	420,917	120	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,100	‡	80
Asians and Pacific Islanders	7,468	136	118
Blacks	3,210	‡	182
Hispanics [§]	20,475	121	88
Whites	379,075	114	121
All Men	393,853	114	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

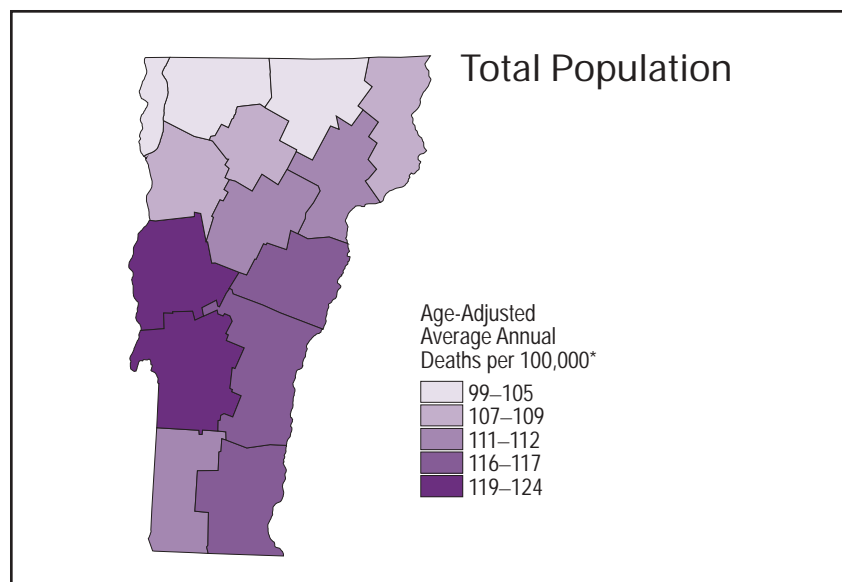
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	611	‡	79
Asians and Pacific Islanders	1,564	‡	105
Blacks	1,096	‡	166
Hispanics [§]	2,054	‡	79
Whites	309,303	115	117
Total Population	312,574	115	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	300	‡	77
Asians and Pacific Islanders	877	‡	96
Blacks	507	‡	153
Hispanics [§]	1,048	‡	72
Whites	161,032	112	113
All Women	162,716	112	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	311	‡	80
Asians and Pacific Islanders	687	‡	118
Blacks	589	‡	182
Hispanics [§]	1,006	‡	88
Whites	148,271	117	121
All Men	149,858	118	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

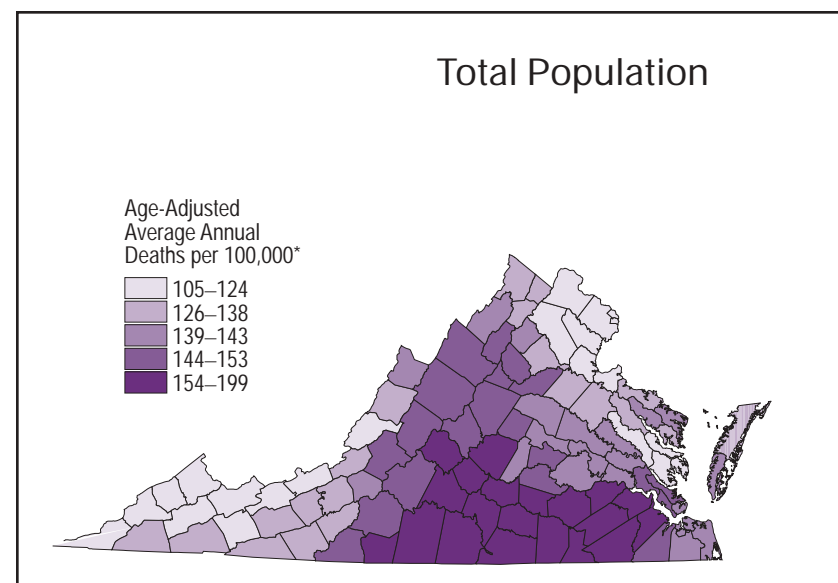
[‡]Insufficient data to calculate a stroke death rate.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Virginia

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,493	‡	79
Asians and Pacific Islanders	105,009	87	105
Blacks	594,457	188	166
Hispanics [§]	87,972	54	79
Whites	2,704,502	128	117
Total Population	3,412,461	137	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,261	‡	77
Asians and Pacific Islanders	57,770	80	96
Blacks	324,950	171	153
Hispanics [§]	45,518	53	72
Whites	1,416,319	122	113
All Women	1,803,300	130	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	4,232	‡	80
Asians and Pacific Islanders	47,239	96	118
Blacks	269,507	211	182
Hispanics [§]	42,454	52	88
Whites	1,288,183	135	121
All Men	1,609,161	146	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

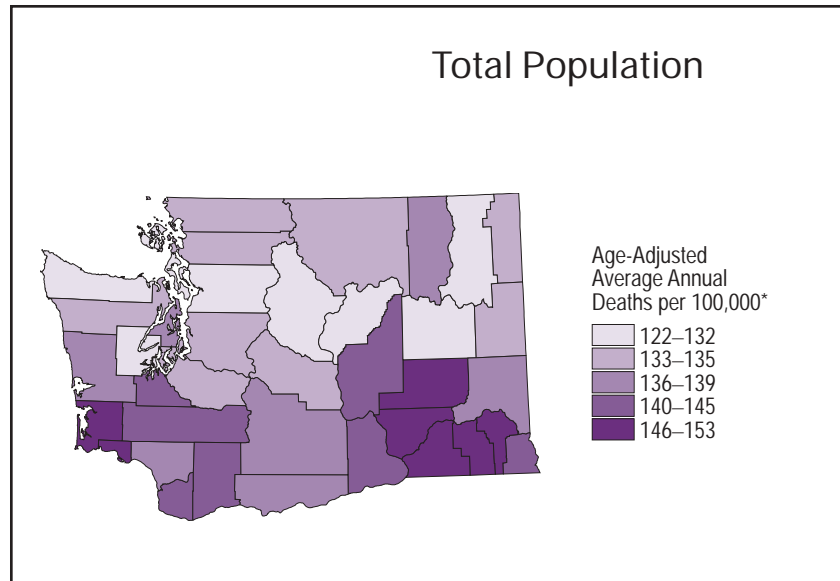
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	39,743	145	79
Asians and Pacific Islanders	136,619	124	105
Blacks	77,348	173	166
Hispanics [§]	103,083	77	79
Whites	2,618,570	133	117
Total Population	2,872,280	134	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	20,444	159	77
Asians and Pacific Islanders	76,680	109	96
Blacks	36,642	171	153
Hispanics [§]	49,886	60	72
Whites	1,346,674	131	113
All Women	1,480,440	132	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	19,299	126	80
Asians and Pacific Islanders	59,939	144	118
Blacks	40,706	175	182
Hispanics [§]	53,197	100	88
Whites	1,271,896	134	121
All Men	1,391,840	135	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

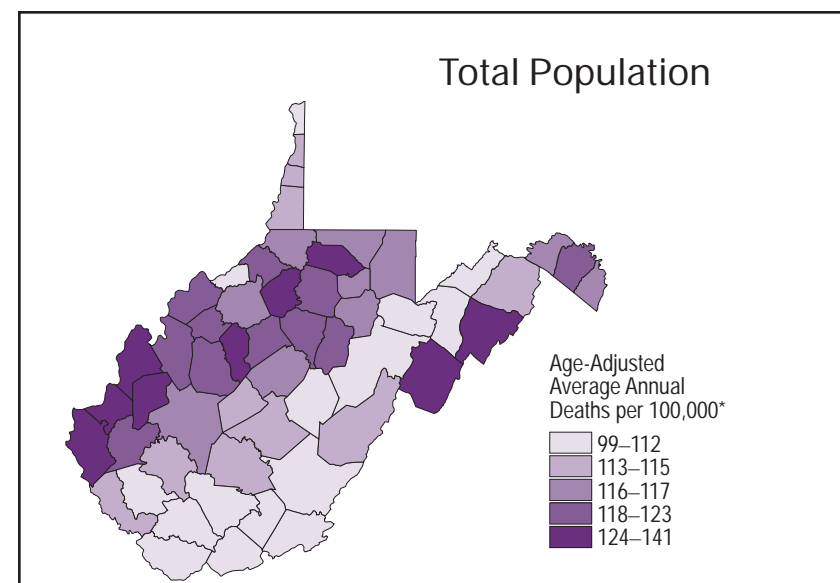
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

West Virginia

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,358	‡	79
Asians and Pacific Islanders	3,984	‡	105
Blacks	27,916	137	166
Hispanics [§]	4,546	‡	79
Whites	958,901	117	117
Total Population	992,159	118	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	695	‡	77
Asians and Pacific Islanders	2,200	‡	96
Blacks	15,620	122	153
Hispanics [§]	2,386	‡	72
Whites	512,755	115	113
All Women	531,270	115	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	663	‡	80
Asians and Pacific Islanders	1,784	‡	118
Blacks	12,296	161	182
Hispanics [§]	2,160	‡	88
Whites	446,146	119	121
All Men	460,889	120	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

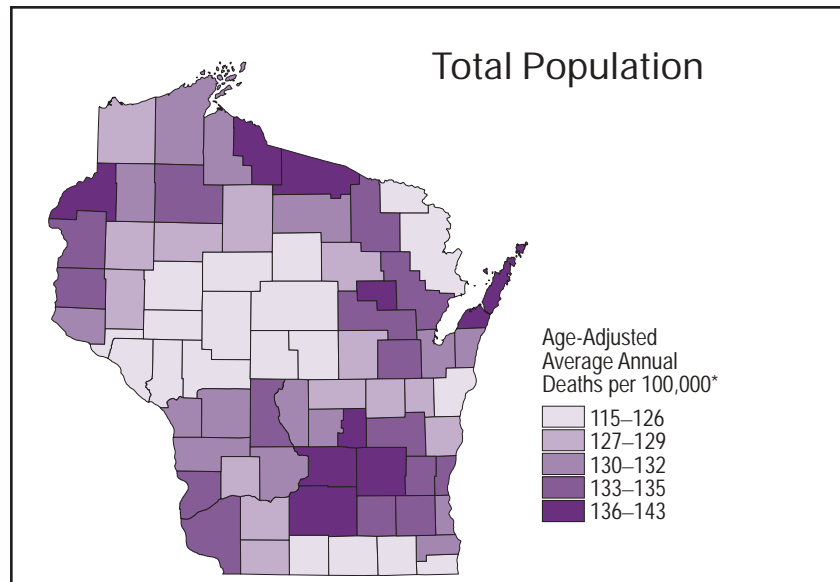
†Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.

‡Insufficient data to calculate a stroke death rate.

§Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998



Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	15,515	180	79
Asians and Pacific Islanders	22,532	141	105
Blacks	100,153	178	166
Hispanics [§]	41,309	49	79
Whites	2,530,308	128	117
Total Population	2,668,508	130	121

Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	8,046	170	77
Asians and Pacific Islanders	12,047	126	96
Blacks	55,077	160	153
Hispanics [§]	20,171	52	72
Whites	1,322,019	122	113
All Women	1,397,189	123	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	7,469	192	80
Asians and Pacific Islanders	10,485	167	118
Blacks	45,076	198	182
Hispanics [§]	21,138	45	88
Whites	1,208,289	136	121
All Men	1,271,319	138	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.

[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

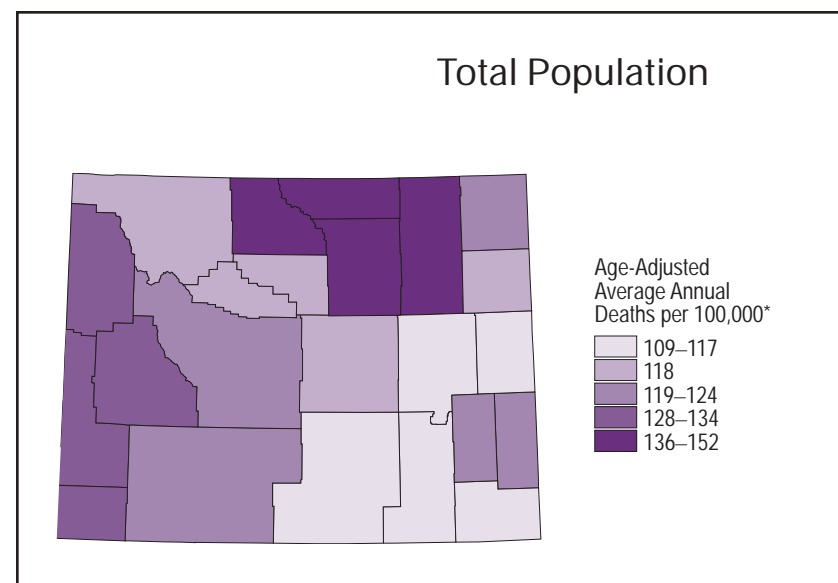
standard 2000 U.S. population.

[§]Includes data for Hispanics in all racial groups.

Stroke Death Rates, 1991–1998

Wyoming

Total			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	3,493	150	79
Asians and Pacific Islanders	1,420	†	105
Blacks	1,479	†	166
Hispanics [§]	10,621	106	79
Whites	238,024	126	117
Total Population	244,416	126	121



Women			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,851	†	77
Asians and Pacific Islanders	865	†	96
Blacks	686	†	153
Hispanics [§]	5,279	106	72
Whites	119,877	124	113
All Women	123,279	124	117

Men			
Race and Ethnicity	State Population 1998	State Rate [†] 1991–1998	U.S. Rate [†] 1991–1998
American Indians and Alaska Natives	1,642	†	80
Asians and Pacific Islanders	555	†	118
Blacks	793	†	182
Hispanics [§]	5,342	105	88
Whites	118,147	128	121
All Men	121,137	128	126

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
[†]Stroke death rate per 100,000 for all residents ages 35 years and older, directly age-adjusted to the

standard 2000 U.S. population.
[†]Insufficient data to calculate a stroke death rate.
[§]Includes data for Hispanics in all racial groups.



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A State Rankings of Stroke Mortality

Table 1. State Rankings and Stroke Death Rates* by Racial and Ethnic Group

State	Total Population		American Indians and Alaska Natives		Asians and Pacific Islanders		Blacks		Hispanics		Whites	
	Rate	Rank [†]	Rate	Rank [†]	Rate	Rank [§]	Rate	Rank	Rate	Rank	Rate	Rank ^{**}
Alabama	135	27	††	††	††	††	180	27	47	6	124	20
Alaska	125	19	158	24	158	28	††	††	††	††	118	16
Arizona	108	8	101	15	113	21	127	6	102	27	108	9
Arkansas	163	34	††	††	††	††	225	36	††	††	157	32
California	124	18	51	6	118	23	169	21	87	22	121	18
Colorado	112	10	59	8	82	9	151	13	96	24	111	11
Connecticut	103	5	††	††	66	5	121	4	56	11	101	6
Delaware	106	7	††	††	††	††	153	14	††	††	100	5
District of Columbia	120	16	††	††	††	††	132	7	††	††	93	2
Florida	102	4	34	3	55	1	181	28	66	15	97	3
Georgia	146	31	††	††	93	15	191	32	43	5	134	26
Hawaii	116	12	††	††	129	25	74	1	89	23	87	1
Idaho	129	22	119	18	145	27	††	††	89	23	128	23
Illinois	125	19	††	††	69	6	153	14	56	11	121	18
Indiana	138	29	††	††	57	2	162	19	60	13	136	27
Iowa	119	15	††	††	103	17	162	19	61	14	118	16
Kansas	120	16	90	14	88	12	183	30	79	18	118	16
Kentucky	133	25	††	††	87	11	165	20	87	22	132	24
Louisiana	133	25	79	12	88	12	172	23	55	10	121	18
Maine	111	9	††	††	††	††	††	††	††	††	111	11
Maryland	117	13	70	11	92	14	145	10	22	2	110	10
Massachusetts	100	2	††	††	87	11	125	5	51	8	99	4
Michigan	124	18	160	25	91	13	151	13	79	18	121	18
Minnesota	125	19	102	16	141	26	158	18	81	19	124	20
Mississippi	140	30	139	19	91	13	183	30	††	††	125	21
Missouri	127	21	32	2	115	22	156	16	82	20	124	20

State	Total Population		American Indians and Alaska Natives		Asians and Pacific Islanders		Blacks		Hispanics		Whites	
	Rate	Rank [†]	Rate	Rank [†]	Rate	Rank [§]	Rate	Rank	Rate	Rank	Rate	Rank ^{**}
Montana	124	18	149	22	††	††	††	††	108	29	123	19
Nebraska	117	13	169	27	††	††	176	25	51	8	116	14
Nevada	118	14	51	6	112	20	154	15	49	7	117	15
New Hampshire	118	14	††	††	††	††	††	††	††	††	118	16
New Jersey	101	3	53	7	59	3	141	9	54	9	97	3
New Mexico	105	6	85	13	108	19	107	3	106	28	106	8
New York	89	1	48	5	59	3	95	2	54	9	87	1
North Carolina	155	32	145	21	75	7	210	34	26	3	143	28
North Dakota	122	17	141	20	††	††	††	††	††	††	121	18
Ohio	117	13	††	††	69	6	146	11	58	12	115	13
Oklahoma	131	24	67	10	124	24	165	20	18	1	133	25
Oregon	146	31	111	17	129	25	209	33	75	16	145	29
Pennsylvania	116	12	40	4	86	10	149	12	89	23	113	12
Rhode Island	103	5	††	††	98	16	157	17	37	4	102	7
South Carolina	169	35	††	††	61	4	237	37	††	††	149	31
South Dakota	116	12	165	26	††	††	††	††	††	††	115	13
Tennessee	156	33	††	††	107	18	220	35	85	21	148	30
Texas	130	23	13	1	80	8	182	29	100	26	126	22
Utah	119	15	61	9	113	21	170	22	98	25	119	17
Vermont	115	11	††	††	††	††	††	††	††	††	115	13
Virginia	137	28	††	††	87	11	188	31	54	9	128	23
Washington	134	26	145	21	124	24	173	24	77	17	133	25
West Virginia	118	14	††	††	††	††	137	8	††	††	117	15
Wisconsin	130	23	180	28	141	26	178	26	49	7	128	23
Wyoming	126	20	150	23	††	††	††	††	106	28	126	22
United States	121	NA	79	NA	105	NA	166	NA	79	NA	117	NA

*Death rates per 100,000 population for 1991–1998 are age-adjusted to the 2000 U.S. population.

[†] The state with the lowest rate was ranked 1. The state with the highest rate was ranked 35.

States with identical rates were assigned the same rank.

[‡] The state with the highest rate was ranked 28.

[§] The state with the highest rate was ranked 28.

^{||} The state with the highest rate was ranked 37.

[¶] The state with the highest rate was ranked 29.

^{**} The state with the highest rate was ranked 32.

^{††} Insufficient data to calculate a stroke death rate.

NA = Not applicable.

Table 2. State Rankings and Stroke Death Rates* by Racial and Ethnic Group: Women

State	All Women		American Indian and Alaska Native Women		Asian and Pacific Islander Women		Black Women		Hispanic Women		White Women	
	Rate	Rank [†]	Rate	Rank [†]	Rate	Rank [§]	Rate	Rank	Rate	Rank	Rate	Rank ^{**}
Alabama	128	23	††	††	††	††	162	23	55	10	120	22
Alaska	131	25	177	15	136	24	††	††	††	††	123	24
Arizona	108	8	98	7	99	17	127	7	94	24	107	10
Arkansas	158	32	††	††	††	††	207	32	††	††	151	34
California	121	17	53	2	106	18	165	24	81	20	119	21
Colorado	112	11	75	5	75	7	152	17	89	22	111	13
Connecticut	98	4	††	††	74	6	115	3	52	7	97	6
Delaware	102	6	††	††	††	††	144	14	††	††	96	5
District of Columbia	113	12	††	††	††	††	123	6	††	††	87	2
Florida	98	4	††	††	53	1	170	25	61	12	93	4
Georgia	138	28	††	††	85	12	171	26	45	4	129	27
Hawaii	105	7	††	††	113	20	††	††	67	14	84	1
Idaho	130	24	††	††	††	††	††	††	77	17	130	28
Illinois	118	15	††	††	61	4	143	13	49	6	115	17
Indiana	134	27	††	††	63	5	151	16	49	6	132	30
Iowa	113	12	††	††	††	††	128	8	54	9	113	15
Kansas	116	14	72	4	84	11	174	27	70	16	114	16
Kentucky	128	23	††	††	††	††	158	20	91	23	127	26
Louisiana	126	21	††	††	82	10	155	18	45	4	116	18
Maine	105	7	††	††	††	††	††	††	††	††	105	8
Maryland	112	11	††	††	94	14	134	9	23	1	106	9
Massachusetts	97	3	††	††	82	10	121	4	45	4	96	5
Michigan	120	16	181	16	86	13	141	12	68	15	117	19
Minnesota	118	15	97	6	132	23	155	18	65	13	117	19
Mississippi	130	24	††	††	††	††	162	23	††	††	118	20
Missouri	122	18	††	††	114	21	139	11	84	21	120	22

State	All Women		American Indian and Alaska Native Women		Asian and Pacific Islander Women		Black Women		Hispanic Women		White Women	
	Rate	Rank [†]	Rate	Rank [†]	Rate	Rank [§]	Rate	Rank	Rate	Rank	Rate	Rank ^{**}
Montana	122	18	145	12	††	††	††	††	††	††	120	22
Nebraska	110	9	††	††	††	††	157	19	††	††	109	11
Nevada	115	13	††	††	94	14	148	15	46	5	115	17
New Hampshire	116	14	††	††	††	††	††	††	††	††	116	18
New Jersey	96	2	††	††	58	3	135	10	49	6	92	3
New Mexico	105	7	75	5	††	††	107	2	101	25	106	9
New York	85	1	44	1	57	2	90	1	49	6	84	1
North Carolina	145	30	133	9	86	13	190	29	25	2	136	31
North Dakota	111	10	134	10	††	††	††	††	††	††	111	13
Ohio	112	11	††	††	63	5	135	10	55	10	110	12
Oklahoma	128	23	64	3	126	22	155	18	††	††	131	29
Oregon	144	29	113	8	145	25	195	30	68	15	143	32
Pennsylvania	111	10	††	††	86	13	139	11	80	19	109	11
Rhode Island	99	5	††	††	††	††	161	22	42	3	98	7
South Carolina	159	33	††	††	††	††	209	33	††	††	144	33
South Dakota	108	8	139	11	††	††	††	††	††	††	107	10
Tennessee	149	31	††	††	98	16	198	31	67	14	143	32
Texas	126	22	††	††	78	8	170	25	89	22	122	23
Utah	120	16	††	††	96	15	180	28	78	18	120	22
Vermont	112	11	††	††	††	††	††	††	††	††	112	14
Virginia	130	24	††	††	80	9	171	26	53	8	122	23
Washington	132	26	159	13	109	19	171	26	60	11	131	29
West Virginia	115	13	††	††	††	††	122	5	††	††	115	17
Wisconsin	123	19	170	14	126	22	160	21	52	7	122	23
Wyoming	124	20	††	††	††	††	††	††	106	26	124	25
United States	117	NA	77	NA	96	NA	153	NA	72	NA	113	NA

*Death rates per 100,000 women for 1991–1998 are age-adjusted to the 2000 U.S. population.

[†] The state with the lowest rate was ranked 1. The state with the highest rate was ranked 33.

States with identical rates were assigned the same rank.

[‡] The state with the highest rate was ranked 16.

[§] The state with the highest rate was ranked 25.

^{||} The state with the highest rate was ranked 33.

[¶] The state with the highest rate was ranked 26.

^{**} The state with the highest rate was ranked 34.

^{††} Insufficient data to calculate a stroke death rate.

NA = Not applicable.

Table 3. State Rankings and Stroke Death Rates* by Racial and Ethnic Group: Men

State	All Men		American Indian and Alaska Native Men		Asian and Pacific Islander Men		Black Men		Hispanic Men		White Men	
	Rate	Rank [†]	Rate	Rank [†]	Rate	Rank [§]	Rate	Rank	Rate	Rank	Rate	Rank ^{**}
Alabama	142	30	††	††	††	††	205	26	††	††	129	21
Alaska	116	9	133	11	201	26	††	††	††	††	110	9
Arizona	107	6	106	7	130	19	125	4	111	23	106	7
Arkansas	168	37	††	††	††	††	248	32	††	††	161	34
California	126	18	48	2	134	20	173	16	93	17	123	17
Colorado	109	7	††	††	93	10	141	5	107	22	109	8
Connecticut	107	6	††	††	55	1	125	4	61	7	106	7
Delaware	109	7	††	††	††	††	164	13	††	††	102	5
District of Columbia	129	21	††	††	††	††	144	6	††	††	102	5
Florida	106	5	41	1	57	2	194	21	73	12	100	3
Georgia	155	34	††	††	103	14	219	29	40	2	141	29
Hawaii	129	21	††	††	147	23	††	††	111	23	86	1
Idaho	125	17	††	††	††	††	††	††	104	20	125	19
Illinois	133	23	††	††	79	6	166	14	65	9	129	21
Indiana	141	29	††	††	††	††	176	18	74	13	139	28
Iowa	125	17	††	††	††	††	212	28	††	††	124	18
Kansas	125	17	109	8	††	††	197	22	88	16	122	16
Kentucky	140	28	††	††	††	††	172	15	††	††	138	27
Louisiana	143	31	††	††	95	11	197	22	72	11	128	20
Maine	119	12	††	††	††	††	††	††	††	††	119	14
Maryland	122	15	††	††	90	9	159	10	22	1	113	10
Massachusetts	102	2	††	††	96	12	124	3	59	6	101	4
Michigan	129	21	124	9	97	13	162	12	95	18	125	19
Minnesota	132	22	109	8	154	24	157	9	107	22	131	23
Mississippi	153	33	††	††	††	††	212	28	††	††	134	24
Missouri	134	24	††	††	116	16	180	20	76	14	130	22

State	All Men		American Indian and Alaska Native Men		Asian and Pacific Islander Men		Black Men		Hispanic Men		White Men	
	Rate	Rank [†]	Rate	Rank [‡]	Rate	Rank [§]	Rate	Rank	Rate	Rank [¶]	Rate	Rank ^{**}
Montana	125	17	152	12	††	††	††	††	††	††	124	18
Nebraska	127	19	296	17	††	††	203	25	68	10	125	19
Nevada	119	12	††	††	134	20	156	8	50	4	118	13
New Hampshire	117	10	††	††	††	††	††	††	††	††	117	12
New Jersey	106	5	††	††	59	3	147	7	61	7	102	5
New Mexico	104	3	100	5	††	††	104	2	111	23	104	6
New York	91	1	54	3	60	4	101	1	61	7	90	2
North Carolina	166	36	162	14	59	3	239	31	††	††	152	31
North Dakota	136	26	153	13	††	††	††	††	††	††	135	25
Ohio	123	16	††	††	78	5	161	11	62	8	120	15
Oklahoma	134	24	69	4	120	17	178	19	††	††	135	25
Oregon	146	32	105	6	110	15	225	30	83	15	146	30
Pennsylvania	121	14	††	††	85	8	161	11	100	19	118	13
Rhode Island	105	4	††	††	††	††	144	6	††	††	104	6
South Carolina	178	38	††	††	††	††	277	34	††	††	152	32
South Dakota	127	19	198	16	††	††	††	††	††	††	125	19
Tennessee	165	35	††	††	121	18	254	33	113	24	154	33
Texas	134	24	††	††	82	7	199	24	113	24	128	20
Utah	114	8	††	††	136	21	††	††	121	25	114	11
Vermont	118	11	††	††	††	††	††	††	††	††	117	12
Virginia	146	32	††	††	96	12	211	27	52	5	135	25
Washington	135	25	126	10	144	22	175	17	100	19	134	24
West Virginia	120	13	††	††	††	††	161	11	††	††	119	14
Wisconsin	138	27	192	15	167	25	198	23	45	3	136	26
Wyoming	128	20	††	††	††	††	††	††	105	21	128	20
United States	126	NA	80	NA	118	NA	182	NA	88	NA	121	NA

*Death rates per 100,000 men for 1991–1998 are age-adjusted to the 2000 U.S. population.

† The state with the lowest rate was ranked 1. The state with the highest rate was ranked 38. States with identical rates were assigned the same rank.

‡ The state with the highest rate was ranked 17.

§ The state with the highest rate was ranked 26.

|| The state with the highest rate was ranked 34.

¶ The state with the highest rate was ranked 25.

** The state with the highest rate was ranked 34.

†† Insufficient data to calculate a stroke death rate.

NA = Not applicable.

A carpenter helps construct a minor league baseball stadium in Lansing, Michigan.



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B Methodological and Technical Notes

County Definitions

Data from several different sources were used in this publication. To ensure comparability of county definitions, we used Federal Information Processing Standard (FIPS)¹ codes to link county definitions across data sets and to reconcile differences. For most states, county definitions were 100% comparable across the data sets. Definitions that were not comparable were modified as needed; details regarding these modifications are explained in the following sections.

Independent Cities

The following independent cities were retained in the geographic database as discrete entities separate from adjacent counties. FIPS codes were modified as needed to allow data from multiple data sources to be accurately linked.

Independent City	State	Original FIPS Code	Modified FIPS Code
Baltimore	Maryland	24510	24007
St. Louis	Missouri	29510	29191
Carson City	Nevada	32510	32025
Suffolk	Virginia	51800	51123

Alaska

Original County	Original County FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Aleutian Islands East	2013	Aleutian Islands	2010
Aleutian Islands West	2016	Aleutian Islands	2010
Denali Borough	2068	Yukon-Koyukuk	2290
Kobuk	2140	Yukon-Koyukuk	2290
Skagway-Hoonah-Angoon	2232	Skagway-Yakutat-Angoon	2231
Yakutat	2282	Skagway-Yakutat-Angoon	2231

Arizona

Independent City	Original County FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Yuma	4027	LaPaz	4012

Hawaii

Independent City	Original County FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Kalawao	15005	Maui	15009

Virginia

Virginia has 34 independent cities. We used the 1996 Area Resource File database to incorporate data from these cities into their adjacent counties, which is standard practice.

Independent City	Independent City FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Bedford	51515	Bedford	51019
Bristol	51520	Washington	51191
Buena Vista	51530	Rockbridge	51163
Charlottesville	51540	Albemarle	51003
Clifton Forge	51560	Allegheny	51005
Colonial Heights	51570	Chesterfield	51041
Covington	51580	Allegheny	51005
Danville	51590	Pittsylvania	51143
Emporia	51595	Greensville	51081
Fairfax	51600	Fairfax	51059
Falls Church	51610	Fairfax	51059
Franklin	51620	South Hampton	51175
Fredericksburg	51630	Spotsylvania	51177

Continued on next page

Independent City	Independent City FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Galax	51640	Grayson	51077
Harrisonburg	51660	Rockingham	51165
Hopewell	51670	Prince George	51149
Lexington	51678	Rockbridge	51163
Lynchburg	51680	Campbell	51031
Manassas	51683	Prince William	51153
Manassas Park	51685	Prince William	51153
Martinsville	51690	Henry	51089
Norfolk	51710	Norfolk	51129
Norton	51720	Wise	51195
Petersburg	51730	Dinwiddie	51053
Portsmouth	51740	Norfolk	51129
Radford	51750	Montgomery	51121
Richmond	51760	Henrico	51087
Roanoke	51770	Roanoke	51161
Salem	51775	Roanoke	51161
South Boston	51780	Halifax	51083
Staunton	51790	Augusta	51015
Waynesboro	51820	Augusta	51015
Williamsburg	51830	James City	51095
Winchester	51840	Frederick	51069

Yellowstone National Park

Independent City	Independent City FIPS Code	Incorporated into Adjacent County	Modified FIPS Code
Yellowstone National Park (Part), Montana	30113	Park	30067

Data Sources

Stroke Mortality Data

We obtained death certificate data for 1991–1998 through the National Center for Health Statistics’s (NCHS’s) National Vital Statistics System,² a compilation of statistics from all death certificates filed in the 50 states and the District of Columbia. Stroke deaths were defined as those for which the underlying cause of death listed on the death certificate was cerebrovascular disease, defined according to the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*.³ The *ICD-9-CM* codes for cerebrovascular disease are 430–438. For each decedent, underlying cause of death, age, race, ethnicity, gender, and county of residence at the time of death were abstracted from computerized death certificate files. Information on Hispanic ethnicity was not routinely collected on death certificates in Oklahoma during 1991–1998 or in New Hampshire before 1993. Consequently, we could not analyze the data for decedents of Hispanic ethnicity in Oklahoma or New Hampshire.

Population Data

We obtained population data for all U.S. counties from the U.S. Bureau of the Census for 1991–1998. These postcensal estimates were calculated by the U.S. Bureau of the Census through extrapolation of linear trends in population growth and intercounty migration patterns between the 1980 and 1990 censuses.

Map Projections

National Maps

We used several different map projections to produce the U.S. maps in this publication. For the contiguous United States, an Albers Conic Equal Area projection was used. For Alaska, the Miller’s Cylindrical projection was used, and the Hawaii map uses geographic coordinates (latitude and longitude). Neither Alaska nor Hawaii is in proper geographic scale relative to the continental United States on the national maps. The

combination of different projections and scales allowed for presentation of a relatively familiar orientation of these geographic features.

The coordinate information for the contiguous 48 states was projected using the Albers Conic Equal Area projection with the following parameters:

Spheroid: Clarke 1866	Central Meridian: -96.000
1 st Standard Parallel: 29.500	2 nd Standard Parallel: 45.500
False Easting: 0.000	False Northing: 0.000
Reference Latitude: 37.500	

The coordinate information for Alaska used the Miller's Cylindrical projection with the following parameters:

Spheroid: Sphere	Central Meridian: 0.000
------------------	-------------------------

State Maps

All state maps were projected using the State Plane coordinate system. Each state map is presented at a size designed to maximize the reader's ability to interpret the data. Thus, the maps are not in accurate geographic scale relative to one another. Because State Plane systems are commonly used by state agencies, their use here maximizes the reader's ability to compare these maps with information from other sources.

Race and Ethnicity Definitions

The race and ethnicity categories used in this publication are based on definitions established in 1977 by Directive 15 of the Office of Management and Budget (OMB), which is the federal agency that defines standards for government publications.⁴ The categories are not based on biological or anthropological concepts. "Hispanic" is considered a designation of ethnicity, not race, and people of Hispanic origin

can be of any race. OMB developed these categories in response to the need for standardized data for record keeping and data collection and presentation by federal agencies (e.g., to conduct federal surveys, collect decennial census data, and monitor civil rights laws).

In 1997, OMB issued new race and ethnicity categories following criticism that the categories did not reflect the country's increasing diversity. All federal agencies were instructed to begin collecting and analyzing data using the new categories no later than January 1, 2003. However, the census and vital statistics data used in this publication were collected before the 1997 directive was implemented. Consequently, the racial and ethnic categories analyzed here are consistent with the 1977 directive.

The 1977 race and ethnicity categories are as follows:

- **American Indian or Alaska Native.** A person having origins in any of the original peoples of North America and who maintains tribal affiliation or community attachment.
- **Asian or Pacific Islander.** A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands (e.g., China, India, Japan, Korea, the Philippine Islands, Samoa).
- **Black.** A person having origins in any of the black racial groups of Africa.
- **Hispanic.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.
- **White.** A person having origins in any of the original peoples of Europe, North Africa, or the Middle East.

Spatial Geometry

The geographic database used in this publication came from the Environmental Systems Research Institute's (ESRI's) ArcUSA database, which includes spatial geometry and characteristics of all U.S. counties.

ESRI modified the 1973 Digital Line Graph source data produced by the U.S. Geological Survey to update county boundaries through 1988. The geographic scale of the spatial geometry (i.e., linework) used is 1:2 million, which is sufficient to identify major county features. Mortality and population data were linked to county geography using FIPS codes.

Calculation of Spatially Smoothed and Age-Adjusted Stroke Death Rates

Rationale for Spatial Smoothing

Although county death rates provide a high degree of spatial specificity, rates in counties with small populations and few stroke deaths can be unstable. This problem is particularly relevant when examining geographic disparities among racial and ethnic groups because many counties have small or nonexistent populations of minority groups. We used two approaches to reduce the statistical instability of county death rates for stroke: (1) temporal aggregation of the 1991–1998 data and (2) application of a statistical procedure known as spatial smoothing.

We chose to spatially smooth stroke death rates using a spatial moving average. Stroke deaths (numerators) and population counts (person-year denominators) for each county were combined with the deaths and population counts of the immediate neighboring counties (i.e., contiguous counties) and then divided to produce an average rate. Thus, a single county's stroke mortality rate actually represents an average of the rates of that county and all its contiguous neighbors.

Calculation of Death Rates

Spatially smoothed and age-adjusted stroke death rates were calculated at the county level by gender and for each of the following racial and ethnic groups: American Indians and Alaska Natives, Asians and Pacific Islanders, blacks, Hispanics, and whites. Rates were also calculated for the total U.S. population. Stroke deaths were obtained from the National Vital Statistics System and included all deaths for which the underlying cause of death reported on the death certificates was listed as *ICD-9-CM*

codes 430–438. Population data were obtained from the U.S. Bureau of the Census.

For each county, stroke deaths (numerators) and population counts (denominators) for 10-year age groups (i.e., ages 35–44, 45–54, 55–64, 65–74, 75–84, and ≥85 years) were summed for 1991–1998. County numerators and denominators were then combined with numerators and denominators of all neighboring counties. Neighboring counties were defined solely by contiguity (as opposed to distance). The combined numerators were divided by the combined denominators to produce spatially smoothed, age-specific (i.e., by 10-year age group) stroke death rates. These spatially smoothed rates were then directly age-adjusted to the 2000 U.S. population for the age groups 35 years and older. These calculations were repeated separately by gender for each of the racial and ethnic groups.

Two constraints were applied to the calculation of county stroke death rates for each racial and ethnic group. For a particular racial and ethnic group (e.g., American Indians and Alaska Natives ages 35 years and older), a stroke death rate was not calculated for any county for which the total number of stroke deaths for that group in that county plus its neighbors was fewer than 20 during 1991–1998.⁵ To avoid calculating rates for counties that had no members of a particular population group but whose neighbors had significant populations, rates were calculated only for counties with a population count of 5 or more during 1991–1998 (i.e., person-years were ≥5).

Information on Hispanic ethnicity was not routinely collected on death certificates in Oklahoma during 1991–1998 or before 1993 in New Hampshire. Consequently, we removed all counties in Oklahoma and New Hampshire from the contiguity matrix when we spatially smoothed the rates for Hispanics, and no death rates for Hispanics were calculated for Oklahoma and New Hampshire.

Standard Population Weights

Because we calculated directly age-adjusted stroke death rates for people ages ≥35 years and not for the entire age range of the population,

we had to recalculate the standard weights for the 2000 U.S. standard population. New weights for age groups 35–44 through ≥85 years were calculated using a two-step procedure. First, we calculated the sum of the original 2000 standard weights for 10-year age groups 35–44

through ≥85 years. Second, for each age group, we divided the original weight by the sum of the weights for ages ≥35 years. The resulting quotients are the new standard population weights. The weights were rounded to two decimal places and used to calculate directly age-adjusted stroke death rates for people ages ≥35 years.

2000 U.S. Projected Standard Population Weights

Age Group (yrs)	Weight
All ages	1.000000
<1	0.013818
1	0.013687
2–4	0.041630
5	0.014186
6–8	0.042966
9	0.015380
10–11	0.030069
12–14	0.042963
15–17	0.043035
18–19	0.029133
20–24	0.066478
25–29	0.064530
30–34	0.071044
35–39	0.080762
40–44	0.081851
45–49	0.072118
50–54	0.062716
55–59	0.048454
60–64	0.038793
65–69	0.034264
70–74	0.031773
75–79	0.027000
80–84	0.017842
≥85	0.015508

2000 U.S. Projected Standard Population Weights for Age Groups ≥35 Years

Age Group (yrs)	Weight
35–44	0.32
45–54	0.26
55–64	0.17
65–74	0.13
70–84	0.09
≥85	0.03

Reporting of Hispanic Origin on Death Certificates in New York City

During 1991–1993, information on Hispanic origin was not reported on an average 18% of stroke death certificates for adults ages 35 years and older residing in New York City. During 1994–1998, the percentage of death certificates missing this information decreased to <3%. After examining New York City death certificate data for 1991–1998, we concluded that most deaths with “unknown” Hispanic origin occurred among non-Hispanic adults.

Our calculations indicated that the percentage of stroke deaths among Hispanic adults increased slightly from 1991–1993 to 1994–1998, whereas the percentage of stroke deaths for non-Hispanic adults increased markedly after reporting improved in 1994. However, because a proportion of the deaths with missing Hispanic origin data occurred among Hispanic adults, the stroke death rates reported here for Hispanic adults are likely underestimated. Erroneous reporting of Hispanics as white on death certificates also causes rates to be underestimated for

Distribution of Stroke Deaths by Hispanic Origin Among Persons Ages ≥35 Years, New York City

Year	Hispanic Origin		
	Non-Hispanic	Hispanic	Unknown
1991	73.8%	9.9%	16.4%
1992	69.3%	11.7%	19.0%
1993	69.0%	11.4%	19.6%
1994	84.6%	13.2%	2.3%
1995	83.3%	15.2%	1.5%
1996	82.6%	15.9%	1.6%
1997	83.9%	14.2%	1.9%
1998	82.4%	15.9%	1.8%

Hispanics (see Section 1). The extent of underestimation may have varied among the five city boroughs, so readers should be prudent when comparing county rates.

Contiguity Matrix for Alaska

We used the contiguity matrix for all U.S. counties from the 1996 Area Resource File database to perform spatial smoothing of stroke mortality rates for this publication. However, this database did not include information for counties in Alaska because Alaska was considered to be a

FIPS Codes for Alaska's 23 Counties	FIPS Codes for Neighboring Counties*							
	1	2	3	4	5	6	7	8
2010	2164							
2020	2170	2261	2122					
2050	2070	2270	2170	2164	2290	2122		
2060	2164	2070						
2070	2164	2060	2050					
2090	2290	2240						
2100	2231	2110						
2110	2100	2280						
2122	2020	2170	2050	2164	2150	2261		
2130	2201	2280						
2150	2122	2164						
2164	2060	2070	2050	2122	2010			
2170	2290	2240	2261	2020	2050	2122		
2180	2270	2290	2188					
2185	2188	2290						
2188	2185	2290	2180					
2201	2280	2130						
2220	2231	2280						
2231	2261	2100	2220	2110	2280			
2240	2290	2090	2170	2261				
2261	2240	2170	2020	2231	2122			
2270	2290	2050	2180					
2280	2220	2201	2231	2130				
2290	2185	2188	2270	2050	2170	2240	2090	2180

*Each county can be bordered by as few as 1 or as many as 8 neighboring counties.

single geographic unit. Because we are interested in the geographic patterns of stroke mortality within the state, we created our own contiguity matrix for the counties in Alaska.

1. National Institute of Standards and Technology. *Federal information processing standards publication 55-3: codes for named populated places, primary county divisions, and other locational entities of the United States, Puerto Rico, and the outlying areas*. Gaithersburg: US Department of Commerce, National Institute of Standards and Technology; 1994. Available on the Internet at <http://www.itl.nist.gov/fipspubs/fip55-3.htm>. Accessed June 12, 2002.
2. CDC. National Vital Statistics System Web site. Available at <http://www.cdc.gov/nchs/nvss.htm>. Accessed June 12, 2002.
3. US Department of Health and Human Services. *The International Classification of Diseases, 9th Revision, Clinical Modification*. Washington, DC: US Department of Health and Human Services, Public Health Service, Health Care Financing Administration; 1980. DHHS publication no. (PHS) 80-1260.
4. Wallman KK, Hodgdon J. Race and ethnic standards for federal statistics and administrative reporting. *Statistical Reporter* 1977;77(10):450-4.
5. Hoyert DL, Arias E, Smith BL, Murphy SL, Kochanek KD. Deaths: final data for 1999. *National Vital Statistics Reports* 2001;49(8):110.

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discuss the periodical collection.



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C Resources

Federal Government Agencies

Office of the Associate Director for Minority Health
Centers for Disease Control and Prevention (CDC)
1600 Clifton Road, MS D-39
Atlanta, GA 30033
Phone: 404-639-7210
Web site: www.cdc.gov/od/admh

The mission of the Office of the Associate Director for Minority Health is to improve the health of African American, Asian American and Pacific Islander, Hispanic American, and Native American and Alaska Native citizens and, where appropriate, members of similar ethnic/racial subgroups both in and outside the United States, through policy development and program analysis at the CDC and the Agency for Toxic Substances and Disease Registry.

Office of Women's Health
Centers for Disease Control and Prevention
1600 Clifton Road, MS D-51
Atlanta, GA 30033
Phone: 404-639-7230, Fax: 404-639-7331
Web site: www.cdc.gov/od/owh

The Office of Women's Health is dedicated to in-depth research and dissemination of information and public policy regarding women's health.

Office of Minority Health
Division of Information and Education
Rockwall II Building, Suite 1085
5515 Security Lane
Rockville, MD 20852
Phone: 301-443-5224, Fax: 301-443-1426
Web site: www.omhrc.gov

The Office of Minority Health, which operates under the Department of Health and Human Services, works to improve collection and analyses of data on the health of racial and ethnic minority populations, and it

monitors efforts to achieve Healthy People 2010 goals for minority health.

The Office of Minority Health Resource Center
Division of Information and Education
Rockwall II Building, Suite 1000
5600 Fishers Lane
Rockville, MD 20857
Phone: 1-800-444-6472
Web site: www.omhrc.gov

The Office of Minority Health Resource Center was established to assist in the exchange of information and analyses of minority health issues. The center collects and distributes information on a wide variety of health topics and facilitates the exchange of information on minority health issues.

Office of Research on Women's Health
National Institutes of Health
Building 1, Room 201
Bethesda, MD 20892
Web site: www4.od.nih.gov/orwh/index.html

The goal of the Office of Research on Women's Health is to ensure that research conducted and supported by the National Institutes of Health addresses issues of women's health, and that there is appropriate inclusion of women in clinical research.

National Heart, Lung, and Blood Institute
National Institutes of Health
Building 31, Suite 4A10, MSC 2480
31 Center Drive
Bethesda, MD 20892
Web site: www.nhlbi.nih.gov/nhlbi/nhlbi.htm

The National Heart, Lung, and Blood Institute is a national program dedicated to research related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, as well as sleep disorders.

Indian Health Service
Special Initiative Branch
Division of Legislation and Regulations
The Reyes Building
801 Thompson Avenue, Suite 440
Rockville, MD 20852-1627
Phone: 301-443-1083, Fax: 301-443-4794
Web site: www.ihs.gov

The Indian Health Service (IHS) is an agency within the Department of Health and Human Services that is responsible for providing federal health services to American Indians and Alaska Natives. The IHS is the principal federal health care provider and health advocate for these populations, and its goal is to ensure that comprehensive, culturally acceptable personal and public health services are available and accessible to American Indians and Alaska Natives.

National Center of Minority Health and Health Disparities
Office of Research on Minority Health
6707 Democracy Blvd., Suite 800
Bethesda, MD 20892-5465
Phone: 301-402-1366, Fax: 301-480-4049

The Office of Research on Minority Health (ORMH) was founded in 1999 by the National Institutes of Health to help solve research questions that result from the disparity of health status among Americans. The ORMH's mission is to support and promote biomedical research aimed at improving the health status of minority Americans across the life span and programs aimed at expanding the participation of under-represented minorities in all aspects of biomedical and behavioral research.

Agency for Healthcare Research and Quality
Center for Cost and Financing Studies
2101 East Jefferson Street, Suite 500
Rockville, MD 20852
Phone: 301-594-1406, Fax: 301-594-2166
Web site: www.ahrq.gov

The Agency for Healthcare Research and Quality (AHRQ) was established in 1989 as the Agency for Health Care Policy and Research. Reauthorizing legislation passed in November 1999 established AHRQ as the lead federal agency on quality research. AHRQ operates under the Department of Health and Human Services and is the lead agency charged with supporting research designed to improve the quality of health care, reduce its cost, and broaden access to essential services. AHRQ's broad programs of research bring practical, science-based information to medical practitioners and to consumers and other health care purchasers.

State and Territorial Agencies

Cardiovascular Health Council of the Association of State and Territorial Chronic Disease Program Directors

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Alabama Department of Public Health
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Cardiovascular Health Program
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Arizona Department of Health Services
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Liana Lianov
Chief, California Heart Disease & Stroke Prevention Program
California Department of Health Services
PO Box 942732, MS-725
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Patrick Barnett
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Colorado Department of Public Health & Environment
4300 Cherry Creek Drive S, Denver, CO 80246
Phone: 303-692-2562, Fax: 303-691-7721
E-mail: pat.barnett@state.co.us

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410 Capitol Avenue, MS-11HEI
PO Box 340308, Hartford CT 06134
Phone: 860-509-7802, Fax: 860-509-7854
E-mail: gary.stamand.@po.state.ct.us

Jill Rogers
Chief, Chronic Disease Prevention & Health Promotion
Delaware Department of Health
Division of Public Health
Jessie Cooper Building
417 Federal Street, Dover, DE 19903
Phone: 302-744-4544, Fax: 302-739-3839
E-mail: JRogers@state.de.us

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Minority Health Organizations

Minority Health Professions Foundation
3 Executive Park Drive NE, Suite 100, Atlanta, GA 30329
Phone: 404-634-1993, Fax: 404-634-1903
Web site: www.minorityhealth.org

The Minority Health Professions Foundation is a nonprofit educational, scientific, and charitable organization that provides support for professional education, research, and community services that promote optimum health among poor and minority people.

National Association for the Advancement of Colored People
4805 Mt. Hope Drive, Baltimore, MD 21215
Phone: 410-358-8900, Fax: 410-580-5771
Web site: www.naacp.org

The National Association for the Advancement of Colored People (NAACP) is the oldest, largest, and strongest civil rights organization in the United States. The principal objective of the NAACP is to ensure the political, educational, social, and economic equality of minority group citizens of the United States. The NAACP is committed to nonviolence and relies upon the press, the petition, and the ballot to fulfill its mission.

African American Health Organizations

Association of Black Cardiologists, Inc.
Peachtree Center, South Tower
225 Peachtree Street NE, Suite 1420, Atlanta, GA 30303
Phone: 404-582-8777, Fax: 404-582-8778
Web site: www.abcardio.org

The mission of the Association of Black Cardiologists is to unite health providers, particularly those who provide cardiovascular care to African Americans, as a group to promote primary prevention, quality of life, and culturally sensitive clinical management of cardiovascular diseases.

Association of Black Psychologists
PO Box 55999, Washington, DC 20040-5999
Phone: 202-722-0808, Fax: 202-722-5941
Web site: www.abpsi.org

The Association of Black Psychologists (ABPSI) is an independent, not-for-profit organization of over 1,400 members. The goal of the ABPSI is to have a positive impact on the mental health of the national black community by means of planning, programs, services, training, and advocacy.

International Society on Hypertension in Blacks, Inc.
2045 Manchester Street NE, Atlanta, GA 30324
Phone: 404-875-6263, Fax: 404-875-6334
Web site: www.ishib.org

The International Society on Hypertension in Blacks (ISHIB) is a not-for-profit professional and medical membership society devoted to improving the health and life expectancy of ethnic populations. ISHIB was founded in 1986 to respond to the problem of high blood pressure among ethnic groups. Its organizational scope includes diabetes, stroke, lipid disorders, renal disease, and other related cardiovascular diseases.

National Black Nurses Association, Inc.
8630 Fenton Street, Suite 330, Silver Spring, MD 20910-3803
Phone: 301-589-3200, Fax: 301-589-3223
Web site: www.nbna.org

The National Black Nurses Association (NBNA) was founded to develop a better health care system for black people, where black nurses and other nurses of color played a prominent role in the system. The NBNA encourages African American nurses to take the lead in order to make a difference in the quality of life in communities of color.

National Association of Black Social Workers
8436 W. McNichols Street, Detroit, MI 48221
Phone: 313-862-6700, Fax: 313-862-6998

The National Association of Black Social Workers was formed in response to issues related to providing human services in the black community, educating social workers for effective service in the black community, and providing opportunities for participation of black social workers in the social welfare arena.

National Medical Association
1012 10th Street NW, Washington, DC 20001
Phone: 202-347-1895, Fax: 202-842-3293
Web site: www.nmanet.org

The National Medical Association is committed to preventing the diseases, disabilities, and adverse health conditions that disproportionately or differentially affect African American and underserved populations, supporting efforts that improve the quality and availability of health care to poor and underserved populations, and increasing the representation and contribution of African Americans in medicine.

American Indian and Alaska Native Health Organizations

Native American Women's Health Education Resource Center
PO Box 572, Lake Andes, SD 57356-0572
Phone: 605-487-7072
Web site: www.nativeshop.org/nawherc.html

The Native American Women's Health Education Resource Center is operated by the Native American Community Board (NACB). The NACB was formed in 1985 by a group of Native Americans living on or near the Yankton Sioux Reservation in South Dakota to address pertinent issues of health, education, land and water rights, and economic development of Native American people.

National Indian Health Board
1385 S. Colorado Blvd, Suite A707, Denver, CO 80222
Phone: 303-759-3075, Fax: 303-759-3674
Web site: www.nihb.org

The National Indian Health Board (NIHB) represents Tribal Governments that operate their own health care delivery systems through contracting and compacting, as well as those that receive health care directly from the Indian Health Service. The NIHB is a nonprofit organization that conducts research, policy analysis, program assessment and development, national and regional meeting planning, project management, and training and technical assistance programs. These services are provided to Tribes, Area Health Boards, Tribal organizations, federal agencies, and private foundations.

Association of American Indian Physicians
1225 Sovereign Row, Suite 103, Oklahoma City, OK 73108
Phone: 405-946-7072, Fax: 405-946-7651
Web site: www.aaip.com

The Association of American Indian Physicians was founded to pursue excellence in Native American health care by promoting education in the medical disciplines; honoring traditional healing practices; and restoring the balance of mind, body, and spirit.

Association of Native American Medical Students
1225 Sovereign Row, C-9, Oklahoma City, OK 73108
Phone: 405-946-7072
Web site: www.aaip.com/anams/anams.html

The Association of Native American Medical Students was founded to provide support and a resource network for all Native Americans enrolled in the various allied health professions schools, to increase the number of Native American students in medicine and other health professions, and to promote its exposure and recognition on a national level throughout the medical community.

Indians into Medicine
University of North Dakota
School of Medicine and Health Science
PO Box 9037, Grand Forks, ND 58202-9037
Phone: 701-777-3037, Fax: 701-777-3277
Web site: www.med.und.nodak.edu/depts/inmed/home.htm

Indians into Medicine addresses three major problem areas: (1) too few health professionals in American Indian communities, (2) too few American Indian health professionals, and (3) the substandard level of health and health care in American Indian communities.

Asian and Pacific Islander Health Organizations

National Asian Women's Health Organization
250 Montgomery Street, Suite 410, San Francisco, CA 94104
Phone: 415-989-9747
Web site: www.nawho.org

The National Asian Women's Health Organization is dedicated to public health advocacy for Asian Americans and empowerment of Asian American women beyond accessing existing opportunities. Programs focus on providing research data and changing public policy to address the reproductive health status of underserved Asian communities.

Asian and Pacific Islander American Health Forum
942 Market Street, Suite 200, San Francisco, CA 94102
Phone: 415-954-9959

The Asian and Pacific Islander American Health Forum is a national advocacy organization dedicated to promoting policy, program, and research efforts for the improvement of health status of all Asian and Pacific Islander Americans.

Association of Asian Pacific Community Health Organizations
1440 Broadway, Suite 510, Oakland CA 94612
Web site: www.aapcho.org

The Association of Asian Pacific Community Health Organizations is a national association representing community health organizations dedicated to improving the health status of Asians and Pacific Islanders in the United States and its territories, especially the medically underserved.

Chinese American Medical Society
281 Edgewood Avenue, Teaneck, NJ 07666
Phone: 201-833-1506, Fax: 201-833-8252
Web site: www.camsociety.org

The Chinese American Medical Society is dedicated to promoting the scientific association of medical professionals of Chinese descent, to advancing Chinese medical knowledge and scientific research, to establishing scholarships and endowments to medical and dental students, and to providing endowments to medical schools and hospitals of good standing.

Hispanic Health Organizations

National Alliance for Hispanic Health
1501 16th Street NW, Washington, DC 20036
Phone: 202-387-5000, Fax: 202-797-4353
E-mail: alliance@hispanichlth.org

The National Alliance for Hispanic Health is dedicated to connecting communities and creating change to improve the health and well-being of Hispanics in the United States, through consumer education and outreach, training programs, policy analysis, development and dissemination, and advocacy.

National Council of La Raza
1111 19th Street NW, Suite 1000, Washington, DC 20036
Web site: www.nclr.org

The National Council of La Raza, with over 200 formal affiliates who together serve 37 states, Puerto Rico, and the District of Columbia, was established to reduce poverty and discrimination and improve life opportunities for Hispanic Americans.

National Association of Hispanic Nurses
1501 16th Street NW, Washington, DC 20006
Phone: 202-387-2477, Fax: 202-483-7183
Web site: www.thehispanicnurses.org

The National Association of Hispanic Nurses is the only national organization representing Hispanic registered nurses in the United States. Its goal is to increase the leadership development of Hispanic nurses and to improve the quality of health of Latino communities.

National Hispanic Medical Association
1700 17th Street NW, Suite 405, Washington, DC 20009
Phone: 202-265-4297, Fax: 202-234-5468
Web site: home.earthlink.net/~nhma

The National Hispanic Medical Association was organized to address the interests and concerns of 26,000 licensed physicians and 1,800 full-time Hispanic medical faculty dedicated to strengthening health service delivery to Hispanic communities across the nation.

Interamerican College of Physicians and Surgeons, Inc.
233 Broadway, Suite 770, New York, NY 10010
Phone: 212-777-3642, Fax: 202-505-7984
Web site: www.icps.org

The Interamerican College of Physicians and Surgeons was founded to improve the health of the Hispanic community, reduce the incidence of preventable diseases, improve educational and leadership opportunities for Hispanic physicians, and encourage Hispanic youths to pursue careers in the health care field.

Women's Health Organizations

National Women's Health Network
514 10th Street NW, Suite 400, Washington, DC 20004
Phone: 202-347-1140

The National Women's Health Network serves two purposes. One arm of its organization is a policy-making and advocacy group for women's health issues. The other component is a clearinghouse and research service for women across the United States.

Jacobs Institute of Women's Health
409 12th Street SW, Washington, DC 20024-2188
Phone: 202-863-4990
Web site: www.jiwh.org

The Jacobs Institute of Women's Health is a not-for-profit organization dedicated to advancing knowledge and practice in the field of women's health. Members of the Jacobs Institute are a multidisciplinary group of health care providers, researchers, policy makers, and advocates.

National Women's Health Resource Center
120 Albany Street, Suite 820, New Brunswick, NJ 08901
Phone: 877-986-9472, Fax: 732-828-8575
Web site: www.healthywomen.org

The National Women's Health Resource Center is a national clearinghouse for information and resources about women's health. Its primary goal is to educate health care consumers and empower them to make intelligent decisions by providing easy-to-understand and easy-to-reach information and services.

American Medical Women's Association
801 N. Fairfax Street, Suite 400, Alexandria, VA 22314
Phone: 703-838-0500, Fax: 703-549-3864
E-mail: info@amwa-doc.org

The American Medical Women's Association is a national organization of women physicians and medical students dedicated to promoting women's health, improving the professional development and personal well-being of its members, and increasing the influence of women in all aspects of the medical profession.

Stroke Organizations

American Stroke Association, National Center
7272 Greenville Avenue, Dallas, TX 75231
Web site: www.americanheart.org

The American Stroke Association is a division of the American Heart Association, which is a not-for-profit, voluntary health organization funded by private contributions. Its mission is to reduce disability and death from cardiovascular diseases and stroke.

Brain Attack Coalition
National Institute of Neurological Disorders and Stroke
Building 31, Room 8A-16, 31 Center Drive, MSC 2540
Bethesda, MD 20892
Phone: 301-496-5751, Fax: 301-496-0296
Web site: www.stroke-site.org

The Brain Attack Coalition is a group of professional, voluntary, and governmental entities dedicated to reducing the occurrence of and the disabilities and death associated with stroke. The goal of the coalition is to strengthen and promote the relationships among its member organizations in order to help people who have had a stroke or are at risk for a stroke.

Centers for Disease Control and Prevention (CDC)
National Center for Chronic Disease Prevention
and Health Promotion
Division of Adult and Community Health
4770 Buford Highway NE, MS K-47, Atlanta, GA 30341
Phone: 770-488-2424, Fax: 770-488-2564
Web site: www.cdc.gov/nccdphp/cvd

The CDC has established cardiovascular health programs in 30 state departments of health across the nation. These state programs are committed to reducing the burden of heart disease and stroke by promoting heart-healthy and stroke-free working and living environments. In addition, the Cardiovascular Health Branch at CDC performs extensive monitoring of recent trends in cardiovascular disease and conducts applied research to prevent cardiovascular disease.

Health Care Financing Administration
Centers for Medicare & Medicaid Services
7500 Security Blvd., Baltimore, MD 21244-1850
Phone: 410-786-3000
Web site: www.cms.hhs.gov

The mission of the Centers for Medicare & Medicaid Services is to serve Medicare and Medicaid beneficiaries. The goal is to launch and

enhance the Medicare education campaign to help beneficiaries and their caregivers become active and informed participants in their health care decisions.

InterAmerican Heart Foundation
American Heart Association, National Center
7272 Greenville Avenue, Dallas, TX 75231
Phone: 214-706-1218, Fax: 214-373-0268 or 972-562-3807
Web site: www.americanheart.org

The goals of the InterAmerican Heart Foundation are to promote an environment throughout North, Central, and South America and the Caribbean conducive to the prevention of heart diseases and stroke; to facilitate the development and growth of heart foundations; and to foster partnerships between health professionals and other sectors of society, including business and government, for the accomplishment of its mission.

National Institute of Neurological Disorders and Stroke
NIH Neurological Institute
PO Box 5801, Bethesda, MD 20824
Phone: 800-352-9424
Web site: www.ninds.nih.gov

The goal of the National Institute of Neurological Disorders and Stroke (NINDS) is to reduce the burden of neurological disease—a burden borne by every age group, by every segment of society, and by people all over the world.

National Stroke Association
9707 E. Easter Lane, Englewood, CO 80112
Phone: 303-649-9299 or 1-800-STROKES (787-6537)
Fax: 303-649-1328
Web site: www.stroke.org

The mission of the National Stroke Association is to reduce the incidence and impact of stroke, to save lives, and to improve the quality of care among stroke survivors.

Patient Resources

National Heart, Lung, and Blood Institute
National Institutes of Health
Building 31, 31 Center Drive, Bethesda, MD 20892
Web site: www.nhlbi.nih.gov/index.htm

The National Heart, Lung, and Blood Institute can supply a wealth of information regarding heart, blood, and lung diseases for patients. Resources are available on the Internet as well as via telephone and direct mail.

American Stroke Association, National Center
7272 Greenville Avenue, Dallas, TX 75231
Web site: www.strokeassociation.org

The American Stroke Association is a division of the American Heart Association, which offers resources for heart disease patients regarding health, fitness, and dietary guidelines. Information may be obtained via the Internet, telephone, or direct mail.

Centers for Disease Control and Prevention (CDC)
1600 Clifton Road, Atlanta, GA 30033
Phone: 404-639-7000
Web site: www.cdc.gov

The CDC is a government agency dedicated to the promotion of health and quality of life by preventing and controlling disease, injury, and disability. The CDC Web site provides information about a variety of health topics, including women's, cardiovascular, and minority health.

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The first edition of the *Atlas of Stroke Mortality* is a major contribution to the field of cerebrovascular disease and provides detailed data relevant to all American people. Thoughtfully prepared, data-driven tables and maps show age and gender distributions, geographic variations, and substantial disparities in stroke death rates by racial and ethnic groups. Although an important reduction in stroke death rates occurred among all groups in the previous three decades, little change was reported during the 1990s. These findings should help focus our health care delivery systems and research agendas by providing, as never before, the baseline from which to measure improvement in the prevention, treatment, and management of stroke.

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The *Atlas of Stroke Mortality* clearly and concisely highlights the demographic disparities of stroke throughout the United States. The striking geographic clustering of stroke deaths in the Southeast will provide further impetus to researchers trying to unravel this mystery. A better understanding of these disparities will be a key step forward for improving stroke prevention.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
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